GENERAL LIBRARY
SEP 7 1920
UNIV. OF MICH.

Engineering
Library

THE ARCHITECTURAL FORUM

AUGUST 1920

Single Copy Sixty Cents ROGERS AND MANSON CO., PUBLISHERS Six Dollars the Year

Architectural and Structural Shapes

Made from BRASS and SPECIAL BRONZE ALLOYS by either the Extrusion or the Rolling and Drawing Process.

Mouldings, Angles, Channels, Tees and special shapes suitable for fabricating fireproof doors, window sash and frames, store fronts, bank screens, grilles, handrails, stair nosings, sanitary base mouldings and other art metal construction.

Brass and Copper Tubes

Iron Pipe sizes for Plumbing Installations.

Benedict Nickel Sheet, Tube and Ingot

For exposed plumbing, ornamental work and hardware where strong, durable material with a permanent white color is required.

Descriptive pamphlets and prices furnished upon application.

The American Brass Company

Main Office:

Waterbury, Conn., U. S. A.

Ansonia Branch
Ansonia, Conn.

Benedict & Burnham Branch
Waterbury, Conn.

Buffalo Branch
Buffalo, N. Y.

Coe Brass Branch
Torrington, Conn.

Kenosha Branch
Kenosha, Wis.

Waterbury Brass Branch
Waterbury, Conn.

COURTESY OF FOSTER BROS., BOSTON

PARK STREET CHURCH, BOSTON, MASS.
From the lithograph by A. H. Hepburn

The
ARCHITECTURAL
FORUM

VOLUME XXXIII AUGUST 1920 NUMBER 2

The Planning of Automobile Sales and Service Buildings

By F. A. FAIRBROTHER
Of the Office of Albert Kahn, Architect Detroit

THE planning of automobile sales and service buildings offers what might be called a changeable problem.

The history of the automobile industry from its early beginnings has been marked by great change and development. Unlike older industries, such as the making of cloth or farming implements, the automobile industry has had what seems to be a meteoric and spectacular growth and its constant development has been reflected in the changes necessary in the planning of buildings for use in connection with the ever growing business.

Naturally, in such a rapid development, processes and even principles have been made obsolete almost over night by the introduction of some new idea. This is well illustrated by citing the revolution in the process of assembling certain makes of cars which was put into effect in one large factory a few years ago. This was the change from assembling stations, to which materials were brought as the car was being put together, to the moving conveyor system whereby the car was assembled progressively as it moved along through the assembly building.

The widespread use of automobiles and the unceasing demand for service of all kinds in connection with them have made it necessary for manufacturers to provide stations in different parts of the country as distributing centers and also to serve as stations where cars could be taken care of and replacement parts provided.

It is our purpose to consider the requirements which usually affect the planning of sales and service buildings and to describe the considerations which have entered into the arrangement of the various structures illustrated. The different departments of the buildings will be described in detail and if the suggestions made seem to be too much in the manner of a text-book it should be remembered that they are intended to set forth a somewhat ideal condition. If, however, any suggestions which may be made are found to be of assistance to any one struggling with the problem of planning a sales and service building, we shall feel repaid.

Automobile sales and service buildings, as a distinctive type, have developed within the last seven or eight years. These buildings are distinctive in that they are a link in the process of making and marketing a product which has been developed on a large scale within two decades and, as seen in the automobile rows of our cities, are as easily recognized as power houses, apartment houses or churches. The developing of this type of building has been one of the marked examples of the improvement in the character of structures devoted to commercial uses and has progressed hand in hand with the vast improvement in the character of the buildings devoted to purely manufacturing purposes.

Garages we have had since we first commenced to drive cars, and stores where automobiles have been displayed have been seen along our Broadways and Michigan avenues since "horseless carriages" ceased to be curiosities and their manufacture was placed on a strong commercial basis.

The first places devoted to the sale and care of automobiles were naturally existing buildings, altered and adapted to the purposes of show rooms for cars and the necessary offices and garage spaces. But as the production of cars increased, and as the automobile became something more than the plaything of the well-to-do, the need for buildings designed especially for the display of cars and serving the needs of purchasers, in the making of repairs and adjustments, together with the attendant advantage of having these made by skilled workmen, became very apparent to the manufacturer. The modern sales and service building was the logical result.

The application of the word "service" to buildings devoted to the wants of automobile owners was doubtless the well chosen catch word of some advertising man, but it was a good word, well fitted to describe the uses of the building, and it surely is not the fault of its originator that we now speak of "service" as applied to almost everything from

Fig. 1. Floor Plans, Sales Building for Ford Motor Company, New York
Albert Kahn, Architect

shining shoes to the altruistic work of the Red Cross.

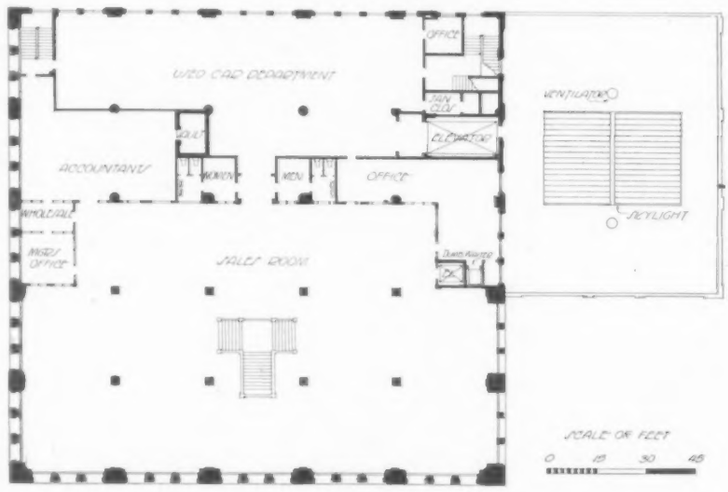
A few of the large automobile manufacturers are the direct owners of their sales and service buildings. Still other service buildings are controlled entirely by the local agents, and in one case, at least, the manufacturer, while not owning the buildings or having little, if any, financial interest in them, yet exercises, by virtue of contracts with his agents, a measure of control over the exterior design of the buildings and over some of the chief characteristics of their interior arrangements.

There is a very real value in having a chain of buildings scattered about the country all of which have a definite and unmistakable common character in design and arrangement so that any one who tours about from place to place may have a feeling of confidence and satisfaction when coming upon a familiar looking building where he can have his little wants attended to. Then, of course, the advertising value of such service buildings is great.

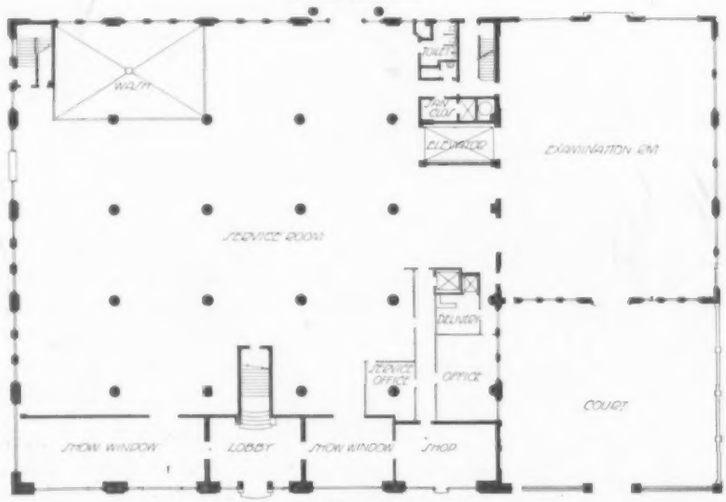
We find, upon analyzing the various kinds of sales and service buildings, that there are four chief classes into which they may be divided. First, we find the class of sales and service buildings where cars are assembled. These are often spoken of as assembly buildings and are usually larger than those where no arrangements for assembling cars are provided.

This type of building would naturally be situated in the center of a considerable territory and would serve as a distribution point to the smaller stations in that territory. It would serve as a distribution point for stock or replacement parts as well as for cars. Features such as sales rooms and headquarters for local sales forces would not constitute an important part of such a building.

The second class of sales and service buildings which we cite is that comprising the headquarters of a large district or state agent. Such a station will be found, in some cases, to serve more than one state and, on the other hand, in a thickly settled part of the country, or in a large state, might take care of only a portion of the territory in the state. In this type of building excellent show room space, also space for sales forces, is necessary. In common with the first class of stations mentioned, the bulk of the business done here will consist of the receiving of cars and parts and the reshipping or otherwise delivering them to subdealers and agents in other cities. Very little space for repair work or service, in the ordinary usage of the term, will be



Second Floor Plan



First Floor Plan

Fig. 2. Building for Cadillac Motor Car Company, Detroit
Albert Kahn, Architect

required. In this class of building considerable office space will be necessary to provide for taking care of visiting sub-agents and others from out of town.

The third class which suggests itself is the metropolitan or central sales and service station, probably being also the main office or headquarters for a large city territory. A building of this class will require admirable show room facilities as well as large office space, although it is quite likely, on account of the fact that such a building will be located on comparatively expensive property, that the service features may be lacking or at least of minor importance. If a building of this class is located in a sea coast city such as New York, it may, if it is the property of the manufacturer, house some at least of the foreign departments of the company.

The fourth and last class which will come under the heading of sales and service buildings is the local sub-agent's quarters or the small branch establishment of some larger dealer. This kind of a station will have show rooms, some office space and probably a large floor area devoted to garage and service departments. The small building of this class is the place where the greater part of the repair and other trouble work is taken care of.

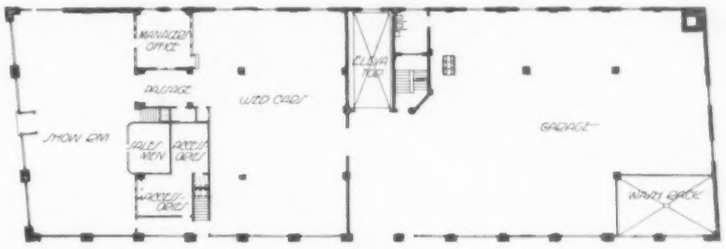
Other kinds of service buildings are common, such as those taking care of batteries or supplying gasolene and also service stations for taking care of tires, but these buildings are not automobile sales buildings nor are they automobile service buildings, although many automobile service buildings have departments devoted to the care of batteries and tires.

In the case of the larger buildings, especially those where cars are assembled, or where large quantities of stock or replacement parts are handled, a railroad siding is an important requirement. On the other hand, for a building serving more as a retail sales center or perhaps located in a city not too far from the factory or for a manufacturer with a separate receiving warehouse, the railroad siding is not important and such a building will, in all probability, be found on one of the main automobile thoroughfares and on more valuable land. The smaller branch or local service stations, of course, do not require railroad sidings.

Corner properties are, naturally, the most desirable, as they offer much better means of access to the service portions of the buildings and as the show room spaces may be arranged with less interruption by driveways and doors. Increased window space for display purposes also makes a corner location particularly desirable.

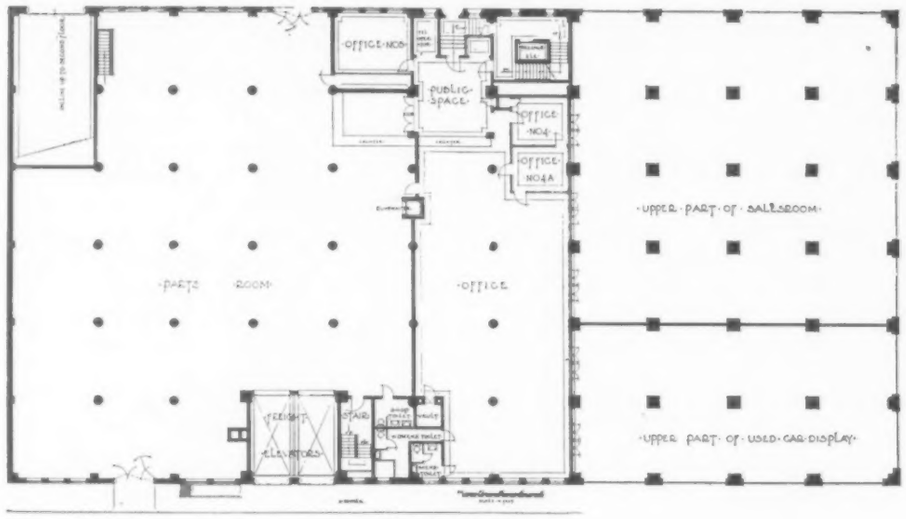
The building of the first chain of sales and service buildings devoted to the marketing and care of automobiles was commenced in 1912 by the Ford Motor Company. These buildings may be said to have paved the way for the similar buildings scattered over the country from coast to coast. The structures built by this company differed largely from the majority of the buildings erected since in that most of them were arranged for the assembling of cars as well as for display and service. The special features of the assembly of cars will be taken up separately in a later portion of this article.

As the ultimate object of all the processes of manufacture is the selling of the product manufactured, the part of the building devoted to the

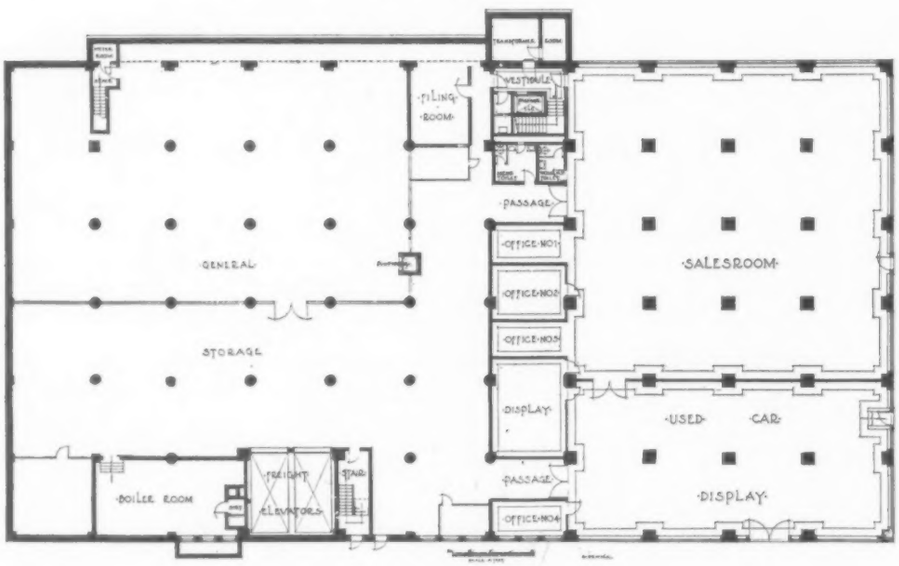


Main Floor Plan

Fig. 3. Building for Packard Motor Car Company, Hartford
Albert Kahn, Architect



Magazine Floor Plan



First Floor Plan

Fig. 4. Building for Willys-Overland Company, San Francisco

making of sales may be considered the most important and will be considered first.

The sales room or show room will be found to vary in size and appointments with every building. The considerations affecting its location and size will vary with the property to be developed. Consideration must be given to the type of car it is proposed to display as well as to the number of models requiring space on the floor. The best display can be made when the room is large and high. The automobile, being an outdoor vehicle, will not look its best when shown in a low or otherwise cramped room. The need for height in the sales room part of the building is a requirement which sometimes makes it desirable to adopt a story height for the entire main floor somewhat in excess of actual needs and this height may easily allow a mezzanine floor to be inserted back of the sales room where offices for the sales department, rooms for purchasers or stock offices may be located.

The position of cars while being displayed will, of course, depend upon the ideas of the sales manager, but it is evident that the room should be so arranged, whenever possible, that windows will be sufficient in width to allow a car to stand reasonably close to them and for the whole car to be seen when one is standing directly in front of the building or when riding by in the street.

The sills of the windows should be low. It has been the custom in many sales rooms to arrange a trough below the sills to receive a line of light reflectors for night display of cars, but this method has been done away with in many recent cases and provision has been made for display lighting by means of spot lights or other suitable fixtures arranged at the sides of show windows or on the transom bars. Lights placed in this way are well adapted to display cars to advantage and are less liable to throw a strong light into the eyes of people who may be on the sales room floor. General illumination of the sales room is likewise important, but is less difficult to arrange than the special display lighting, for the essential features of the general illumination are not greatly different from those in any large room.

Certain features are essential in the arrangement of a satisfactory sales room. Among them we might mention the need of a large door from the garage or service portion of the building for bringing cars into the sales room. This door will also provide means of communication for customers going to or coming from the garage. Access should also be planned to the parts and accessories sales depart-

ments from the sales room. An attractive display case for accessories will always be desirable.

Here also should be arranged a space for salesmen's desks as well as some central position for an information desk. In some cases the best position for a salesmen's space is in a recess or other somewhat retired place where they may look up prospects and use the telephone freely. In such cases it might be found convenient to provide some sort of a private office off the sales room to which a salesman can withdraw with his prospect and where the process of signing on the dotted line may be carried out in quiet. If there are only one or two salesmen's desks on the floor, the private office may not be required. The information desk may also be the position of the telephone operator and a place where advertising folders, catalogs and other literature may be kept for distribution. It will be found desirable to have a customers' room and perhaps a retiring room for women in some convenient location adjacent to the sales room.

The sales room illustrated in the plan of the Ford Motor Company's building in New York, Fig. No. 1, presents an attractive arrangement where the cars are all displayed on one floor and where sufficient space is provided for a number of cars without crowding.

The arrangement for the display of cars provided in the plan of the sales and service building of the Cadillac Motor Car Company's building in Detroit, Fig. No. 2, differs considerably from the example just mentioned in that the show space for cars intended to be seen from the street is arranged in separate show windows sufficient in depth for one car only, while the larger display room is located on the second floor. This arrangement saves considerable ground floor space for service uses which would otherwise be taken up with the customers, first floor sales room and office spaces.

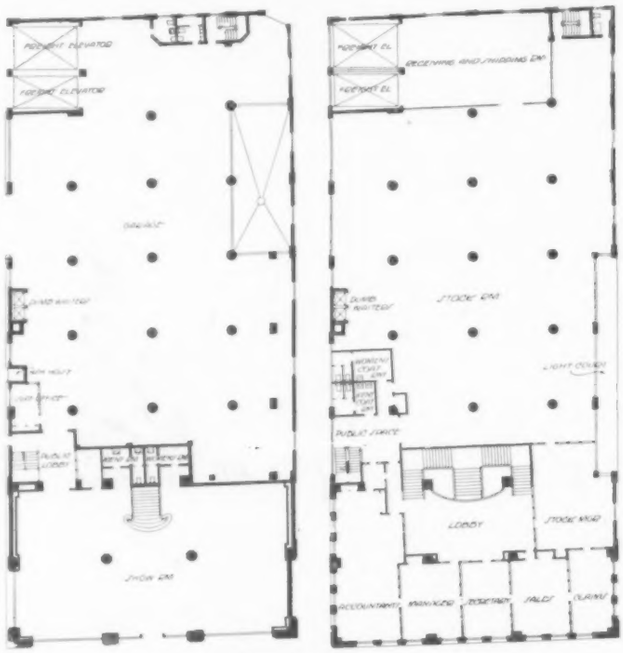
The sales room devoted to the display of used cars is, of course, less important than the room for display of new cars. Some such room is desirable, however, and in some cases is absolutely necessary. The used car problem confronts nearly all dealers and is dealt with in various ways. In some cases the show rooms are placed on the ground floor, perhaps back of the new car salesroom, and in other cases it will be placed in the second story. In the case of the Packard Motor Car Company's building in Hartford, Fig. No. 3, the used car sales room is located back of the main sales room and faces a side street, affording display windows which are good but less desirable than those on the front. The room itself is finished somewhat more simply than the sales room for new cars. The Willys-Overland Company's building in San Francisco, Fig. No. 4, shows an example of a used car display room occupying a corner room of nearly equal importance with the new car sales room.

A special place in almost every sales and service station will be required for the sale of parts and accessories. This department must be accessible to the public and should be so placed as to be easily reached both from the sales room and from the

Sales and Service Building for Willys-Overland Company, San Francisco

Mills, Rhines, Bellman & Nordhoff, Architects

garage and repair parts of the building. It should also be provided with convenient access from outside the building, making it possible for customers to reach it without having to pass through the sales room. It is usually found desirable, where things can be comfortably arranged, to have a public space, with a counter, opening into the stock room, and also a cashier's office or cage adjacent to the public space and connected with the accounting offices. An arrangement which would embody such features would, unless the ground floor area were very large, suggest the placing of the parts sales department on the second floor of the building. This has usually worked out well and is not too remote for customers to reach.



First and Second Floor Plans

Fig. 5. Building for C. C. Coddington, Charlotte, N. C.
Albert Kahn, Architect

The arrangement shown in the plan of the building for the Willys-Overland Company in San Francisco, Fig. No. 4, works out very well, as advantage is taken of the natural rise of the ground to locate the parts department above the level of the sales room and yet reached from the side street by a very few steps.

In the building for Mr. C. C. Coddington, in Charlotte, N. C., Fig. No. 5, the parts sales department is located on the second floor and the public space is placed near the general offices. This works out well here as the stock office, adjacent to the parts department, has convenient connection with the office lobby at the head of the main stairs. It is through this office that orders from local dealers throughout the territory are received and cared for.

A stock room, of course, is essential. It will be found to vary considerably in size. If the building is the headquarters, say, of a state agent or even the direct branch of the manufacturer and supplies the needs of various agents in smaller nearby towns, the stock room is apt to be very large.

It should be possible to close off the stock room from other parts of the building in order to make it more difficult to "lift" small and valuable parts which can be easily concealed and carried away. In some cases where the stock room occupies the whole or greater part of a floor and the elevator opens directly into it, it is desirable to have a separate receiving room where goods may be uncrated. Such an arrangement is shown in Fig. No. 5.

The stock room should have convenient communication with the repair department and machine shops as it is necessary for these departments to get parts from stock in making adjustments and repairs. A dumb waiter is often used for this purpose and will make it possible, when located properly, to serve various departments on a number of floors.

The stock parts themselves are kept in various ways. Some rooms may be fitted up with a fine array of steel shelves or bins and again others may be arranged with plain wood shelves and boxes. The weight of materials in this room is apt to be such that it is wise to figure floors for a somewhat heavier load than some other parts of the building, allowing perhaps two hundred pounds live load per square foot.

Further requirements affecting the planning of sales and service stations will be described in a succeeding number of THE ARCHITECTURAL FORUM.

"Lugger's Hill," Broadway in Worcestershire

ANDREW N. PRENTICE, ARCHITECT

By HAROLD DONALDSON EBERLEIN

AT Broadway, in Worcestershire, is a very modern expression of the Cotswold architectural tradition which is significant to the student of domestic architecture, partly because of its intrinsic qualities as an individual house, and still more because of the general exposition it affords us of a certain principle involved. That principle affects the whole question of the propriety of adherence to or departure from tradition, and the measure in which such adherence or departure may be either justifiable or desirable. Before entering upon a discussion of the principle, however, it is well to scan closely the physical properties of the fabric; the preparatory scrutiny will clear the way for deductions.

Garden Tea House

In its dominant characteristics "Lugger's Hill" conforms to Cotswold tradition, that is to say, in the particulars of (*1*) the materials employed, (*2*) the manner in which they are used, and (*3*) the general lines into which the composition has been cast. The walls are of the local tawny limestone, with occasional variations in color ranging from cream to dull orange and weathering to a warm gray. For the roof the customary Cotswold stone tiles, obtained from the neighboring quarries, were employed. The walls show a face of roughly hewn rectangular stones, of wide diversity in size and dimensions but so laid as to preserve the effect of more or less regular courses. Chimney stacks, lintels and corners are of carefully dressed ashlar work in the same stone, as are also coping slabs, the ball finials at the gable peaks, and columns wherever they occur. The elements of the whole mass agree with traditional Cotswold usage;

View of "Lugger's Hill" from the Approach

Window at "Russell House," Prototype for "Lugger's Hill"

—a combination of two or more long ridged and gabled units, joined together at right angles.

The house is unmistakably a Cotswold structure; even if quite removed from its surroundings and set down in the middle of Sahara, one could not err regarding its origin. But, notwithstanding this unequivocal assertion of Cotswold character, any examination closer than a mere glance will reveal particulars that serve to differentiate "Lugger's Hill" from what is popularly conceived to be the norm of Cotswold practice.

The scale is somewhat broader and larger than is customary in the older houses of the Cotswold district; the units are wider or deeper than the old Cotswold builders usually employed. This difference necessitates a much greater spread of the roof and is met by flattening out the pitch of the roof considerably more than is customary in the typical Cotswold house of earlier date. The fenestration is different, both in the matter of placement and in the treatment accorded the individual windows; on the east front the veranda sheltering the garden door, and the balcony above the veranda, are somewhat reminiscent of Georgian inspiration. All these items of departure from what is usually considered as the traditional Cotswold precedent are sufficient to account for a substantial difference of appearance from that of the ancient type. While permitting himself no small freedom of interpretation, and precluding any possible charge of blind following of precedent, the architect has nevertheless very happily contrived to preserve the essential Cotswold spirit.

Each and every divergence from strict traditional usage had a reason either in meeting some very practical and modern physical requirement or else in the expression of a justifiable preference. The larger scale and the greater width or depth of the several divisions of the structure are obviously made necessary by the dimensions and arrangement of the rooms to be provided for in the plan. As for the fenestration and the motifs

Façade Showing Use of Bow Windows at "Lugger's Hill"

VIEW OF FORECOURT FAÇADES

VIEW FROM THE GARDEN, "LUGGER'S HILL," BROADWAY, WORCESTERSHIRE

ANDREW N. PRENTICE, ARCHITECT

DOORWAY EXECUTED FOR INIGO JONES

DETAIL OF FIREPLACE IN STUDIO

"LUGGER'S HILL," BROADWAY, WORCESTERSHIRE. ANDREW N. PRENTICE, ARCHITECT

adopted for windows, doors and verandas there is not so radical a divergence from local precedent as might at first be imagined;—a fact that will be more explicitly pointed out later on.

The interior treatment of "Lugger's Hill" is distinctly of the period of Queen Anne with certain later details;—early Georgian for the most part, while there is one doorway which is the work of Inigo Jones. This was taken from the master's former studio in London and incorporated in the new house. The detail of the woodwork everywhere else, and especially the carving of the fireplace in the library, will speak for itself. The paint in the library is a light green, in the dining room a darker green, and in the other rooms white.

"Cotswold architecture," be it noted, is a somewhat comprehensive term and needs, perhaps, some explanation for those not fully familiar with it on its own native hills and in all its phases. There is, to be sure, a general Cotswold type or style that possesses a singular unity and, at the same time, exhibits a peculiar detachment from all other regional manifestations so that it is not to be confounded with any of them. This style possesses a unity and a detachment determined by the characteristics of available building materials, by a unique combination of conditions, and by strongly pronounced habits and methods of craftsmanship that persisted with exceptional tenacity, notwithstanding the assimilation, from time to time, of influences from the outside world. And yet, within that unity are to be found such manifold diversities that the student of Cotswold architecture is rewarded with the delights of ever recurrent novelty. There is a Tudor phase, a Stuart phase, a Queen Anne, an early Georgian and a late Georgian phase, and each is distinct in its expression from kindred and contemporary phases elsewhere.

A Corner of the Studio

Bow Window in the Library

Broadway is an epitome of Cotswold architecture. Within the limits of the village one may find every one of the phases just mentioned, and one item in this visible record of the genesis of a tradition is "Russell House," which supplied the prototype for the fenestration of "Lugger's Hill." Late in the eighteenth century "Russell House" was converted from a Tudor hostelry into a private dwelling and the new owners, with the appreciative judgment so often displayed in that period, devised a window treatment that successfully expressed the current taste in a Cotswold medium without doing violence to the spirit of the existing building;—an ingenious grafting of a new

shoot on the stock of mellow Cotswold tradition.

To have thrust into this village of homogeneous though diversified composition a new house of unrelated or exotic type would have been an affront. Even though the house in itself might have been of excellent design and might have afforded the architect a free and more alluring scope for the exercise of invention, the impropriety would have been none the less real. It would have introduced a jarring note into surroundings of complete harmony. The building of any new house in a place of Broadway's narrow limits carries with it a measure of architectural responsibility far greater than would be the case in a more extended community, for here each individual structure has a relatively greater prominence and an anachronism would have no chance of being hidden away.

There was one course, and only one, open to the architect:—to accept the local tradition and to make such adaptations or modifications as common sense and the manifest needs of the occasion indicated. In so doing he not only complied successfully with the physical requirements imposed by the task, but he also showed his faith in the value of a vital local tradition, very much alive because it has satisfied, and still satisfies, all the plainly evident demands of the situation, and has always been flexible enough to incorporate new elements of approved worth without impairing its own architectural integrity.

Detail of Entrance Front

Some Recent California Architecture

THE WORK OF LOUIS CHRISTIAN MULLGARDT, ARCHITECT

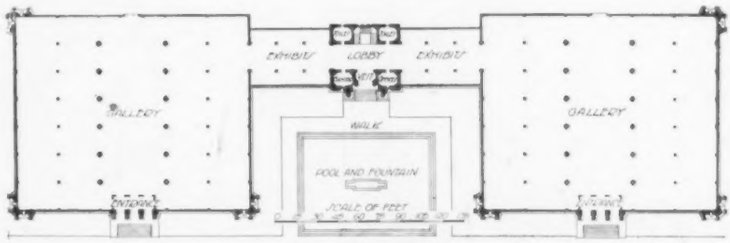
WHILE various architectural styles are identified in the popular mind with the early history of many of the older sections of the country, there is possibly no part of the United States to which any particular kind of building belongs in quite the same degree as that to which southern California and the surrounding district may lay claim to the Spanish styles. The circumstances surrounding the early use of Spanish methods of building suggest a page from mediæval history or a leaf from a forgotten romance. The earliest builders of structures which yet remain in this region were the early Franciscan missionaries,—at once discoverers, pioneers and soldiers of the cross,—who dotted the hillsides and valleys of southern California with their missions and monasteries. These old structures are built in the effectively simple Spanish style which has ever since seemed to belong, in a sense, to the region which was the scene of their apostolic labors.

Of late years architects of the far West have turned in an ever increasing degree to the use of this form of architecture. Visitors to the Exposition at San Diego brought back marvelous tales of the glory of Spanish architecture as there exemplified.

The success of these exposition buildings established a precedent which has had a powerful influence in the determining of architectural styles in southern California and particularly in the case of large buildings of a public or semi-public character.

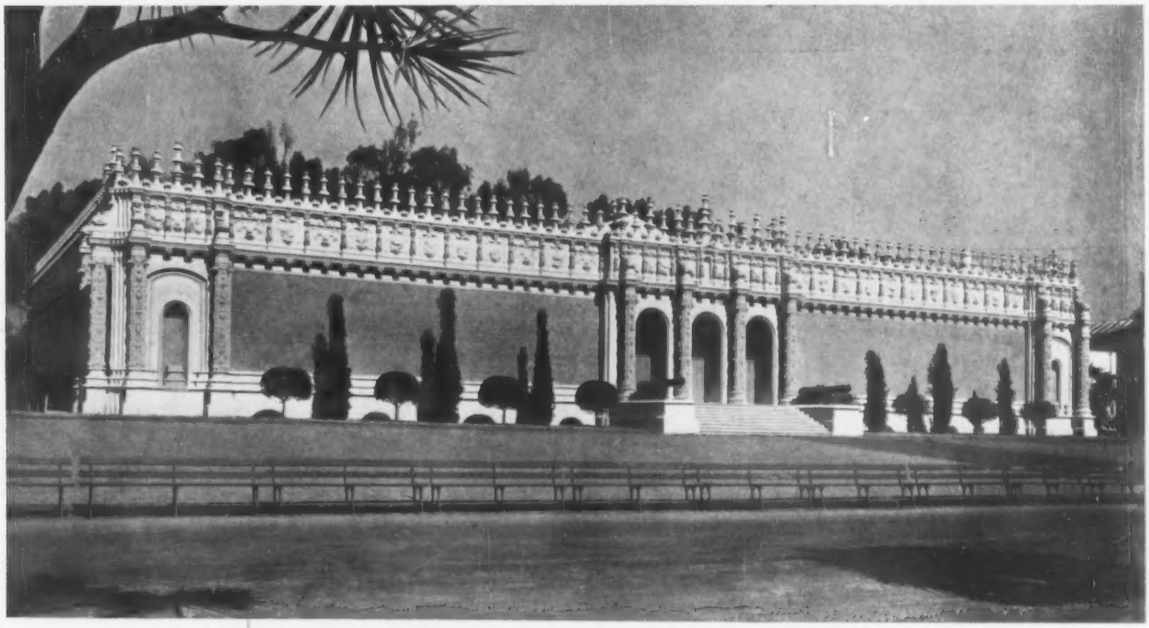
This style abounds in opportunity for the effective use of space; it affords adequate scope for the successful treatment of large areas of floors or ceilings or of broad expanses of wall, and the most successful results are often found to follow the skilful use of comparatively simple materials.

Two recent examples of the use of these Spanish traditions in building are the work of Mr. Louis Christian Mullgardt, architect, of San Francisco. The more important of the two buildings is the new structure for the Memorial Museum in Golden Gate Park, San Francisco, which came into being largely as a result of the keen interest taken by San Francisco's journalist, Mr. M. H. DeYoung, in the original museum, a relic of the Mid-Winter Fair of 1893. There existed a rare collection of valuable exhibits, the result largely of individual gifts, and the obvious necessity of a permanent museum building has resulted in the structure under discussion.



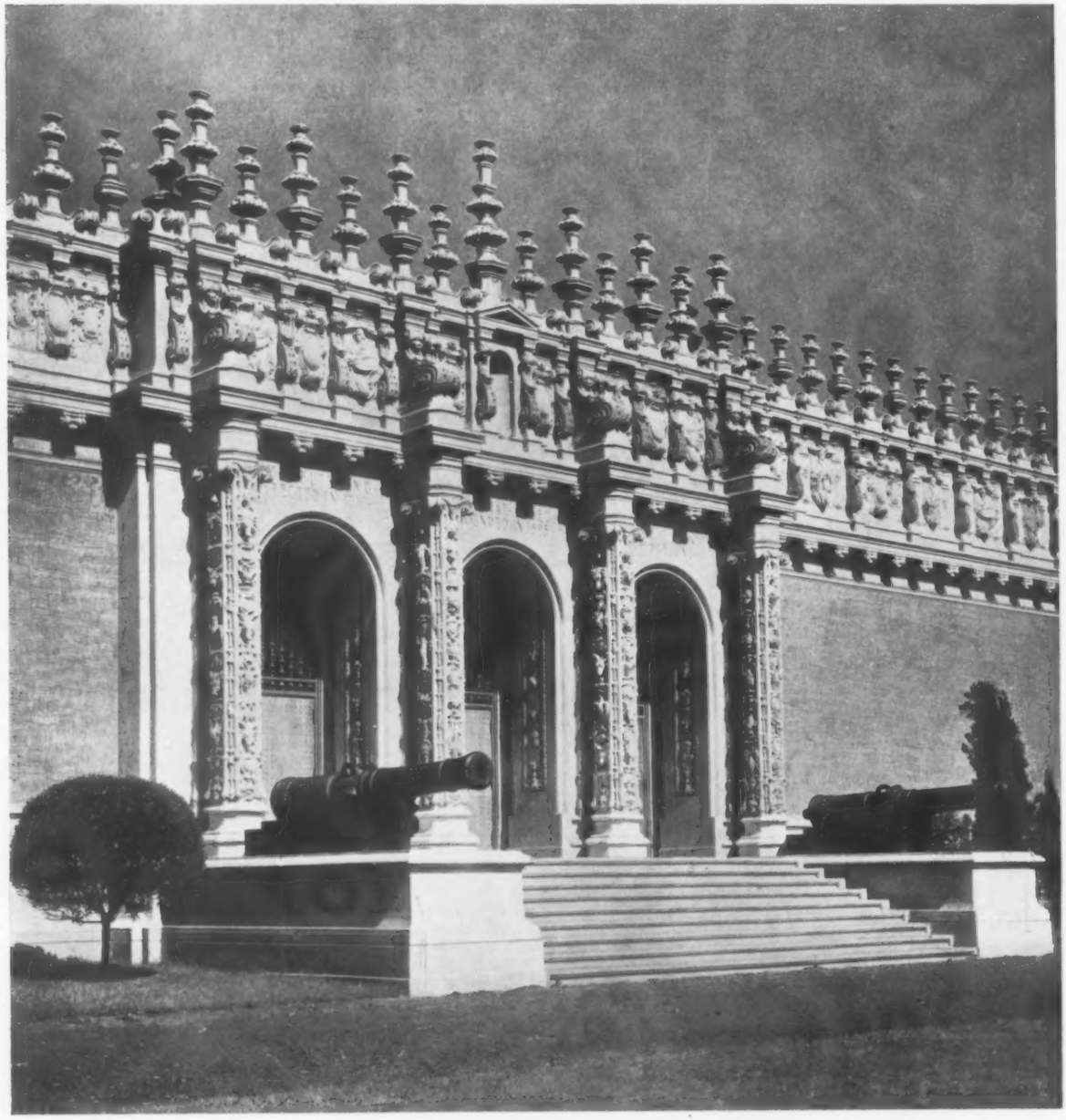
Main Floor Plan

Like most of the world's great institutions the



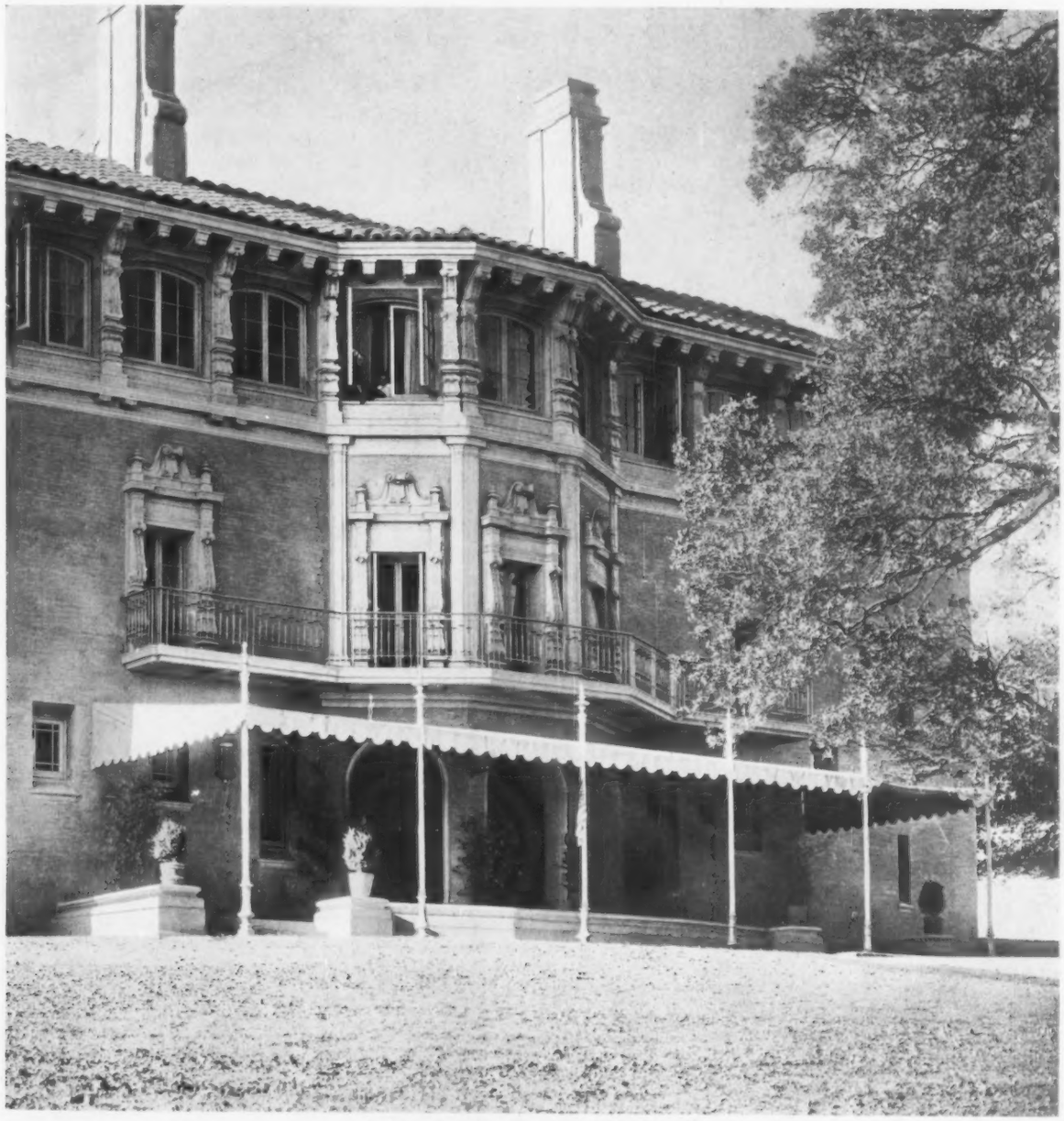
General View of Memorial Museum, Golden Gate Park, San Francisco

Memorial Museum is to be the result of gradual development and continuous growth. The architect has very wisely planned, therefore, for a building which may be developed gradually and yet which will at no stage of its development appear to be anything but a structure which is finished and complete. The museum, as it is shown in the accompanying pictures, is but one of the two parts which will form the completed building. Midway between the two pavilions, which will be connected by a smaller gallery, is to be a square tower, which will dominate the group and upon which will be lavished the wealth of ornament and symbolism which is already used upon the part of the museum which is already built. The structure is of reinforced concrete with hollow tile walls. Cement plaster of a texture which somewhat resembles Travertine marble is used for outside walls and the lavish ornament of the exterior is of cast stone. The tone quality of the building is a delicate buff pink which might be said to be in harmony with the colorful landscape of California.



Detai of Main Entrance Doorways

Memorial Museum, Golden Gate Park, San Francisco



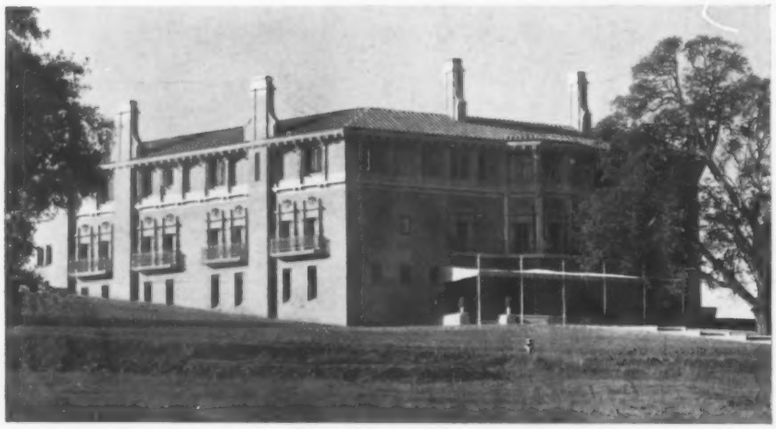
DETAIL OF ENTRANCE ON MAIN FAÇADE

FIRST FLOOR PLAN

SECOND FLOOR PLAN

PRESIDENT'S HOUSE, LELAND STANFORD JUNIOR UNIVERSITY, PALO ALTO, CALIFORNIA

LOUIS CHRISTIAN MULLGARDT, ARCHITECT

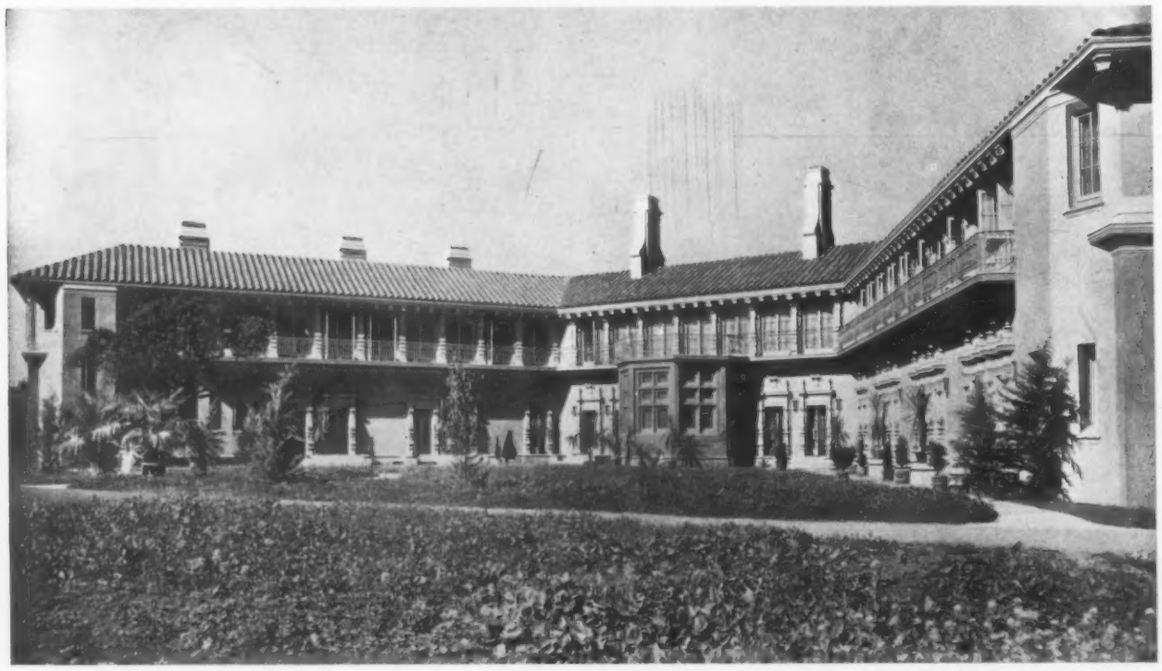


View of Left Wing and Main Façade

The unusual appearance of the exterior is due in a large measure to the striking use of symbolism very effectively displayed. The purpose for which the building exists makes necessary large wall surfaces which form a most effective contrast for decoration massed about doorways, at the corners of the building and in the broad frieze or cornice which extends around the four sides. The high symbolism which is worked out in the frieze and about entrance portals portrays the development of California and the progress of civilization and the arts. This history in symbol begins with the depiction of plant and animal life, then deals with the early aborigine with his spear and string of fish. In the later development of the symbolism appear the early explorers and the Spanish friars, then the pioneers of '49 who came with pick and gun for gold but who stayed to build the basis of the commonwealth. All this sequence of symbolism leads up to its culminating architectural expression in a figure of Superior Intelligence, type of the justice and progress of the world. The upper part of the tower will have a chime of bells.

Of a somewhat different Spanish type is the president's house at Leland Stanford Jr. University. Here the problem was to adapt the Spanish style to the use of a structure which is not a public building in the usual sense of the term but primarily a residence which must be also of sufficient size and character to serve the official needs for which the home of a university executive must often be used.

In plan the structure is U shaped with the sides of the U extended at obtuse angles, the wings forming a court and gardens which have been planned to afford a view of distant mountain ranges. The house, a three story structure, presents a very bold interpretation of the Spanish style; ornament, while used with becoming profusion, is not permitted to dominate the exterior but is confined to use at the traditional centers,—about doorways and windows and about chimneys.



Detail of Court Façades

President's House, Leland Stanford Junior University

ARCHITECTURAL & BUILDING ECONOMICS DEPARTMENT

C. STANLEY TAYLOR, *Associate Editor*

Interesting Points from Official Investigation of the Co-operative Plan of Apartment Ownership

THAT the co-operative method of apartment house ownership and promotion holds continually increasing interest not only in larger cities, but in smaller towns throughout the country, is demonstrated by real estate reports of transfers of buildings and the filing of plans for new buildings to be sold on this basis. In the past few issues of THE FORUM many points relative to co-operative ownership and development have been indicated, but a recent official investigation of this general plan of buying apartments brings out added points and strengthens those already outlined.

A few months ago in New York City, where the greatest activity in co-operative purchasing is to be found, Alderman William F. Quinn introduced in the Board of Aldermen a resolution requesting an investigation of the co-operative plan of buying apartments to be made by Tenement House Commissioner Frank Mann. The results of this investigation were outlined in Mr. Mann's report to the Chairman of the Sub-Committee on Buildings of the Mayor's Housing Conference Committee of New York. Mr. Mann in this report has outlined frankly and definitely the requirements which, after investigation, he would demand if he were purchasing an apartment on the co-operative plan, and the various important points in this report will be brought up in following paragraphs with some editorial comment.

Mr. Mann's general comments were as follows:

"As Chairman of the Mayor's Housing Conference Committee I deprecate any attempt to discourage home ownership. I have called attention to the fact that out of 6,000,000 people in New York more than 5,700,000 have no interest in homes. This is lamentable and the principle of home owning should be encouraged.

"There is nothing inherently wrong in selling multi-family houses on the co-operative plan. There is no defect or disadvantage in purchasing on the same plan. There are no more dangers in the pathway of co-operative ownership than in individual ownership of one- and two-family houses. The danger of a purchaser losing his equity by reason of inability to comply with the terms is just as manifest. As a matter of fact, there is less danger of losing one's equity in purchasing on the co-operative plan if proper care is exercised in examining into the character of the sellers and the character of the financing of their operation.

"Were I to purchase an apartment on the co-operative plan I would demand the following requirements:

"*Full Co-operation*—The plan should be surely co-operative—every tenant in the building should participate in the plan."

Two Types of Ownership

As has been explained in other issues of THE ARCHITECTURAL FORUM there are basically two types of co-operative ownership. The first, which is approved by Mr. Mann as above, is that in which each owner is a tenant of an apartment. The second plan is that which involves tenancy of 40 or 50 per cent of the apartments by owners, the balance of the apartments being leased at market rentals in order that the income may offset the cost of maintenance of the building and consequently reduce the owner's rental.

There is no doubt that Mr. Mann's approval of the first plan is well founded in that it is a simple arrangement where all tenants are co-operative owners and consequently there is little room for the management problems involved where part of the space is leased; which means that the operation is not so intricate nor has it as many possibilities of failure as the partial owners' tenancy plan. On the other hand, it must be realized that the plan through which a proportion of the apartments are rented offers strong inducements to the purchasing of stock in the co-operative company, as it is quite possible to reduce the owners' rental to practically nothing if the building is divided and operated on the proper basis.

The latter method of ownership has opened up possibilities of stock promotion and sales at inflated values involving an exorbitant profit to promoters, and this is probably the reason why Mr. Mann does not look favorably on the second plan. On the other hand, there have been a number of successful co-operative projects developed in New York City during past years in which a building was only partially occupied by the owners among whom the equity of a building was divided.

These plans properly developed, and with a reasonable profit for the owner which was charged originally as part of the building cost, have been very successful. In most cases the owners' rent has been approximately 30 per cent of a normal rental established for the neighborhood, and investors in this class of property have received a return averaging from 14 to 18 per cent on money invested.

Mr. Mann's statement should, therefore, be qualified as shown by experience. The first plan of ownership is the best in simple form for dividing equally the cost of maintenance in the building.

On the other hand the second plan offers the best business proposition as it opens up a definite channel for the reduction of maintenance cost as it affects the owner who occupies an apartment in the building, or the investor who has purchased stock in the co-operative company.

The Importance of Location

"*Location*—As co-operative housing is for residence uses, the utmost care must be observed to purchase only buildings in firmly established residential neighborhoods, with a careful selection of the co-operators."

Not only is careful selection of location for a building of this type important, but care must be taken to anticipate the class of residential occupancy. There are many people who would not be interested in purchasing an apartment in a co-operative apartment house if they had any reason to believe that the neighborhood would tend to lose any of the unusual qualifications which call for location at a given point.

It is well known that in the average city certain neighborhoods are definitely classified by the type of people who may be developing homes in the vicinity. Consequently in locating a building of this nature the advice of real estate experts should be sought in order to analyze the trend of development, not only to avoid commercial or industrial development in a city or town not protected by a zoning plan, but to determine as closely as possible the character of residential occupancy which may be expected for years to come. This is often indicated by the price of land, which though high may be desirable because of its value as a determining factor in the class of construction and occupancy which may be expected.

"*Price*—The price at which the building is to be purchased should be its fair marketable value. If it is a new building the value of the land should be ascertained and the cost of construction added, plus a reasonable profit. If it is an old building the value of the land, plus the present replacement value of the building, less a liberal allowance for depreciation, depending upon the length of time the building has existed."

In buying land for buildings of this nature it has proven better to buy land in already well established residential neighborhoods, even though the original cost is much higher than in partially developed sections. The neighborhood which already bears the stamp of high class residential development, particularly if the land is protected against commercial and industrial encroachment through the medium of long term restrictions, offers the best location for a building of this nature.

In general, the building should be located within easy transportation distance of business and amusement centers, and in planning the building a definite class of occupancy should be determined upon and catered to, both in plan and location.

"*Title*—Care should be taken as to the examination of title by the employment of a title company or a reputable lawyer to see that the title offered is marketable, or that it is free and clear from all incumbrances, excepting such as shall be definitely agreed upon."

"*Mortgage*—If the property is purchased subject to a mortgage, the mortgage should be either for a long term with an amortization plan or a savings bank mortgage, which is reasonably certain of permanency, and in no case should the mortgage be for more than 60 per cent of the market value of the property. The plan should include the setting aside of a certain amount annually for the retirement of the mortgage."

As indicated in this paragraph the co-operative ownership method offers particularly good inducements to institutions or individuals having money for loan on real estate. As nearly as can be determined, there is no record of a co-operative apartment house having undergone a foreclosure of mortgage.

In the usual co-operative plan, as Mr. Mann says, a sinking fund is established which will gradually retire the mortgage. Each owner in paying an established owner's rental pays an amount toward this sinking fund. Naturally, as the mortgage is reduced the equity ownership is increased, so that this sinking fund is in effect a savings account to the owner's credit.

Details of Management

"*Incorporation*—Title to the land and building should be conveyed to and held by a corporation made up of the tenant-owners, the charter of which should limit the corporation to the ownership and operation of the building, in order to provide against possible speculation in other enterprises by action of a majority of directors and to insure the proper distribution of the proceeds of the sale of the building should a sale be effected."

The points just outlined should be given careful consideration by the purchaser of a co-operative apartment. He should know definitely what he is buying, and in a restricted corporation as outlined above he does know. Inversely, from the viewpoint of those interested in developing co-operative apartment housing schemes, it is well to realize that this form of incorporation safeguards the investment of the individual stockholder, and is the best and easiest form for successful promotion.

The operation of the building, such as management and negotiation of mortgages and similar business, is usually carried on by a committee of owners appointed often in a ratio of three committee members representing ten individual owners.

"*Management*—It is not practical or desirable for a group of tenants to manage the details of the property. This should be delegated to a reputable and competent individual or firm in that line of business."

The committee of owners, as outlined in the fore-

going editorial comment, usually takes charge of the general management of the property. As members of this committee, however, are not expert in this work it is customary and wise for the committee to appoint a professional real estate management company or individual in charge of the details of this work. He in turn usually renders a monthly report to the committee, who approve the report and at stated periods report in turn to a stockholders' meeting, usually every six months or every year, in the form of treasurer's report and general reports.

"*Leases and Tenancy*—The share of the ownership in the building should be separated from the tenancy; a schedule of rents adopted for each apartment which, in total, would provide an income sufficient to pay the expenses of operation and fixed charges, including taxes, etc., a fixed amount to be set aside for the amortization of the mortgage and a balance sufficient to pay a reasonable return on the investment in the form of dividends. Leases should be entered into between the tenant-owners and their corporation, providing for annually renewable leases, containing proper restrictions and the provision that they cannot be terminated except for failure to perform or upon notice from the tenant to the landlord on the first day of July, terminating the lease on the first day of October following, in which event the apartment can be re-let for the benefit of the tenant-ownership corporation. Or a plan should be adopted which should include in the rentals paid by the tenant-owners an income sufficient to meet all fixed charges and amortization, and in addition a sum to meet contingencies.

"Collective or co-operative ownership has many advantages in these days of high living cost, because it reduces the rent of each apartment to its share of the actual cost of maintenance and operation of the building.

"I agree that collective or co-operative ownership as it is particularly applied to the ownership of a home in the City of New York, where the majority of our population must for economic and other practical reasons reside in apartments instead of individual homes, in addition to securing a home from which one will not have to move, brings down the rent and affords a safe and profitable investment, when the plan of ownership requires the payment by the tenant-owners of a sufficient income to meet all fixed charges and amortization, and an additional sum to meet contingencies.

"I emphasize this particular feature for the reason that the average family are not certain as to how long they may be able or desire to remain in one location, and they should be free under the terms of their purchase to vacate the premises and, if they so desire, retain their investment.

"Under the tenant-ownership plan the tenant is protected against increase of rents and is assured a permanent home, and is afforded a safe and profitable investment. There is no better asset to a community than for its citizens to be interested in home ownership."

Practical Methods of Financing Home Building Projects

THE acuteness of the housing situation still continues, and the most difficult problem involved is that of obtaining financing. In a number of cities and towns where the pressure of industrial need is added to the general housing shortage, various methods of solving the financial question have been developed, and as this subject is of general interest and of application to the business of the clients of many architects, we will from time to time present brief analyses of successful methods of financing which have been developed.

In Detroit, where an acute housing shortage exists, probably the most successful plan of financial aid has been developed by the House Financing Corporation of which Mr. Eugene W. Lewis is President and General Manager. This Corporation has been organized and financed by a number of large employers in Detroit and it has as its purpose the financing of home building on a basis which offers a fair interest return on money invested.

The House Financing Corporation was organized about one year ago to carry out its activities under three plans. These plans are known as:

1. Banking Plan
2. Operation Plan
3. Contractor's Financing Plan

The plans are described as follows:

1. *Banking Plan*—Under this plan any one owning a building lot may have a house erected thereon by the Corporation, either after his own plans and specifications, which the Corporation must approve, or from the plans and specifications furnished by the Corporation. The result of the investigation of an application and investigation department indicates the maximum amount of money that should be loaned to the applicant, stating the sum that the investigation shows the applicant may carry without particular handicap to his other domestic requirements. The Corporation loans up to a maximum of 80 per cent on its appraisal figure of the house and lot.

2. *Operation Plan*—Under this plan the Corporation employs its capital direct by purchasing lots *en bloc* in various parts of the city, erects its own houses thereon and makes the sale of them after completion. At this time it owns about three hundred such lots on which it is conducting building operations, erecting from six to twenty on each property. As will be noted, this plan will add a great number of houses, but it will not produce quickly enough the large number of homes necessary for the proper relief of the situation. Careful

study of conditions and reports from those in best position to have full and accurate knowledge of the facts, indicate that something over two-thirds of the houses erected during the last year in Detroit have been built by independent contractors, either as individuals or as building firms. In other words, this large number of houses has been produced by men who use their capital in purchasing lots and building houses thereon for sale. It is quite obvious that any plan which would keep this great factor from slowing down, in fact, could stabilize and increase this effort, would be of great benefit to the city and further conserve the purposes for which this Corporation was formed.

3. *Contractor's Financing Plan*—This seems to provide what is necessary to further stimulate building and assist in securing the results so much desired for relief of the city's housing proposition. Under this plan the Corporation cannot only keep its capital in more liquid condition, but it secures the distinct advantage of having, literally, hundreds of contractors working for it and the city on a stabilized and assured basis to the contractor. The Corporation has supervision over the type and character of house that is to be built, the price at which it is to be sold to the customer, and can indicate the localities in which these houses should be built, thus securing building operations in the localities where they are most needed. Contractors engaged in independent building operations during the last year have, for the most part, tied up their capital, the income or turnover from it not being sufficient to enable the contractor to continue to do building work on anything but a small scale, if at all. This Corporation finances temporary loans on collateral notes, if necessary, in order to get the contractor started on a new operation. It then finances the building operation from time to time as it progresses under its plan in detail, by taking the contractor's three-year collateral note.

The above is a short résumé of the three general plans under which the Corporation is operating at this time, and as indicated, it will be noted, they are different in character and would seem to cover comprehensively — though in different ways — a practical solution for the quick and stable relief of the situation. The organization is complete in its various departments for proper operation and conduct under these plans, its effort and the result being limited only by the amount of capital available.

As the requirements of the situation call for a large and extensive building program, it is essential that a large amount of fixed capital be available and employed. As soon as this fixed capital is practically all invested, a plan for revolving it will be instituted. This revolving of funds will, of course, be based upon the securities of the several kinds that have been developed in the conduct of the business. These securities form the safest kind of diversified collateral and will make a most attractive investment.

Some of the Results

Some interesting details of the working out of this plan were brought out in a discussion with Mr. Lewis. The types of houses which are constructed or financed are developed at the lowest possible cost to meet the need of the industrial classes. Any individual applying for assistance in home building must be an American citizen and no house is financed in which the cost of maintenance and ownership will exceed 25 per cent of the owner's income.

It has been the experience of the House Financing Corporation that there have been few applications under Plan No. 1 for individual home construction owing to the fact that much of the real estate purchased in Detroit has been on a speculative basis and that individual home building has proven so expensive as to discourage this method of solving the housing problem.

Under Plan No. 2 as outlined, the Corporation has already built a large number of houses. These houses are designed in the offices of the Corporation and contracts are let to contractors experienced in this line of work, who are allowed approximately 12½ per cent profit on the operation, which carries also the overhead of the Corporation amounting to about 5 per cent more. These houses are sold to individuals on easy terms.

Under Plan No. 3 many builders have been assisted. This plan contemplates the creation of liquid capital for the builder who otherwise must wait for the use of his capital until his houses are sold. The introduction of this plan found many contractors in Detroit entirely stopped in the production of homes because they had tied up all their capital and were forced to wait for sales.

In selecting the contractors to be benefited through Plan No. 3 Mr. Lewis stated the Corporation's attitude as follows:

"The best builder for this class of construction is not the big builder or the builder of houses costing $15,000 or $20,000. He is the man who has been active in the construction and sale of low cost dwellings."

In assisting builders under Plan No. 3 the House Financing Corporation controls the sale price of the houses in order that there will be no exorbitant profit. A profit of about 15 per cent is allowed to the builder, together with a fair profit on the lot determined by appraisal.

Export Trade and the Building Situation

IN the June issue of this Department of THE ARCHITECTURAL FORUM there was presented an article, "General Business Conditions as They Reflect on the Building Situation," which has resulted in some interesting comment. Among the letters received was one which brought out several definitely interesting points. This letter, together with the editor's reply, is printed as of general interest to those who are giving thought to future conditions which influence the building situation.

The following letter was received from a New York architect:

"First of all, there seems to be some doubt in business circles as to whether the crest of the wave of business actually has been reached, and it is pointed out that we now depend to quite some extent on world conditions. The world at large seems to have empty shelves and is only now and very slowly getting into condition to replenish.

"In the market for building materials and appliances we must recognize the fact that a great many new consumers have appeared and their number is increasing. The house famine is universal and severe, indeed practically no relief is in sight while the financing is becoming increasingly difficult.

"Before the war England and Germany enjoyed an enormous foreign trade in such materials. Both are now suffering from a severe house famine and material prices easily three or four times those of 1913. Scarcity of labor, high wages and impossible conditions of transportation also exist. In fact our labor troubles are a mere nothing compared with conditions in Europe. On the other hand, Europe lacks the organization and labor saving machinery which has been built up in this country during the last forty or fifty years through the competitive system in an effort to meet the steady rise in the prices of labor and materials. How will Europe meet the new conditions?

"Is it not reasonable to assume that there will be a heavy drain on our building material market, at least for many years, while a new system is being built up elsewhere? There will be an end to wildcat war conditions without a doubt.

"If I might make a suggestion it would be on the desirability of studying the approximate requirements and economic strength of our foreign customers for the next few years. A good many of our manufacturers of building materials are increasing their facilities even to the tune of 200, 300 and 400 per cent, at least in some departments. That is a good indication of their view of the coming market. Altogether it certainly is a puzzling condition, and one very difficult to survey."

Following will be found the reply to this letter:

"We have for some time been puzzled, as many others undoubtedly are, regarding the influence of European business in its effect on the stability of material prices in this country. It is very difficult indeed to measure this effect. As nearly as we can determine from contact with building material manufacturers, particularly those who have had recent experience in selling abroad, it would seem that the increase in their production facilities as referred to in your letter is largely in view of a steady volume of domestic business which the shortage in buildings of every type would seem to call for.

"We do not think the average building material manufacturer places much confidence in a volume of foreign business. Primarily we believe this is true because the general experience of those who have attempted to sell in foreign countries has been somewhat discouraging. The cause for discouragement is, to a certain extent, a strong tendency on the part of foreign buyers to procrastinate. Behind this procrastination, however, there seems to be a tacit organization against any dissipation of economic expenditure. By this we mean that in France, for instance, the tendency seems to be that, as expenditure on forms of material involving labor must be made within the country, the general tendency is to encourage local production in every possible way; and secondarily to purchase from war weakened powers which have received national credit from France.

"The same condition is met to a greater or less extent in other European countries. We believe that the production of building materials in Europe will be increased to an extent never before known in order to meet the need in the reconstruction program of European countries.

"After all, is it not logical that this should be the case? The war drained European countries have very little credit to exchange with this country for necessary materials of reconstruction. Their credit has already been overstrained in purchasing the necessary materials of war, and they are following, perhaps far more than we realize, the trend which always comes when the credit of a nation is expended, outside its national boundaries. In other words, the flow of money has been steadily outward —not from the government to its people, which in a sense is a passing of money from the left hand to the right—but from the government to the people of another state.

"This money—or credit, if you will—has been expended, as already stated, largely for materials of war. If it had been expended for materials of industry it might ultimately be returned in the form of production. But the expenditure for war material is an unfortunate expenditure, in that the volume of credit so used is almost totally destroyed and is possessed of no investment feature. By this we mean that in purchasing munitions from this country and in the use of this war material in destructive form, the value of the amount of national credit so used is gone forever.

"On the other hand, where machinery for industrial production is purchased, this machinery is used for local production and consequently returns the investment with profit."

Constructive Analysis of the Building Situation

SENATE COMMITTEE ON RECONSTRUCTION AND PRODUCTION GIVES SPECIAL ATTENTION TO BUILDING

THROUGH the efforts of Senator William M. Calder a Special Committee of the Senate on Reconstruction and Production has been created. The purpose of this Committee, of which Senator Calder is Chairman and Senators Kenyon (Iowa), Edge (New Jersey), Wolcott (Delaware) and Gay (Louisiana) are members, is to investigate building and all forms of housing throughout the country and all industries upon which the construction industry is directly and indirectly dependent. Senator Calder in a speech in the Senate of the United States has commented in regard to this Committee as follows:

"In my opinion the adoption of this resolution by the Senate is a timely act, recognizing as it does that structural development is necessary for the fuller utilization of the nation's resources, for the production of its essentials, and for the amelioration of its housing conditions, and that construction was curtailed by the war and is now hampered by an unprecedented demand for consumables.

"The scope of the Committee's work is necessarily extended because of the interdependence of the various factors, it being evident that construction cannot proceed without transportation, labor, and capital, and that construction of all kinds is necessary for increased production.

"The time allotted to the Committee is comparatively short. Accurate and detailed information is essential. In order to amplify and verify data otherwise obtained, it is the desire of the Committee that it may receive from the senators and congressmen their personal knowledge as to home conditions, together with their suggestions as to means to relieve these conditions."

The construction industry to-day is in great need of a constructive investigation of this nature. It can confidently be expected that in this investigation information will be developed which will tend to show more clearly than ever before the position of the construction industry in our economic structure and the actual hampering conditions which are to-day holding back the great volume of active and beneficial production in this line.

The fundamental problems of the construction industry would seem to be in order of importance as follows:

(*a*) Finance
(*b*) Transportation
(*c*) Labor

Building to meet the acute shortage of homes and the general shortage in other lines of construction is definitely discouraged through the lack of financial support in the form of building loans and mortgages. As a reason, or an excuse, for this attitude on the part of loaning interests, the unstabilized condition of building material prices and labor cost is advanced. Actually, however, it would seem that investment funds are being directed to other lines which offer greater interest or profit returns. If mortgage money were made available a great volume of construction would proceed; and with better transportation conditions it is felt that the building material producers in this country would meet the demand on a fairly stabilized cost basis.

Government housing is a fallacy for many reasons, particularly its effect in stifling competitive or speculative building. On the other hand it would seem entirely feasible that federal credit might be properly used to encourage the availability of building loan and mortgage money for those types of construction most necessary to aid in the increase of industrial production.

Manufacturers everywhere are hampered by a lack of housing for their human machinery. Consequently the volume of production which might be expected from them as individual units is often in exact ratio to the quality and proportion of employees limited by lack of housing and proper community facilities. It is common experience in practically any industrial center today to find employers making statements that they could use 200 to 300 more men if they had places for their families to live. In many plants which are fully manned the quality of labor is low because turnover is high owing, to an extent not realized by the average manufacturer, to a shortage not only of housing facilities but of proper community facilities.

The Committee on Reconstruction and Production has sent out to architects a letter asking for information as follows:

"It is possible that through your practical and everyday familiarity with the situation as an architect, you can supply the committee with information as to the shortage of housing and industrial construction in your locality, whether such shortage is increasing or decreasing, and the effect of such shortage upon public welfare and industrial development. The Committee would be pleased to learn your views as to the factors contributing to the shortage and also to be informed as to any remedial measures which have been undertaken to relieve the situation."

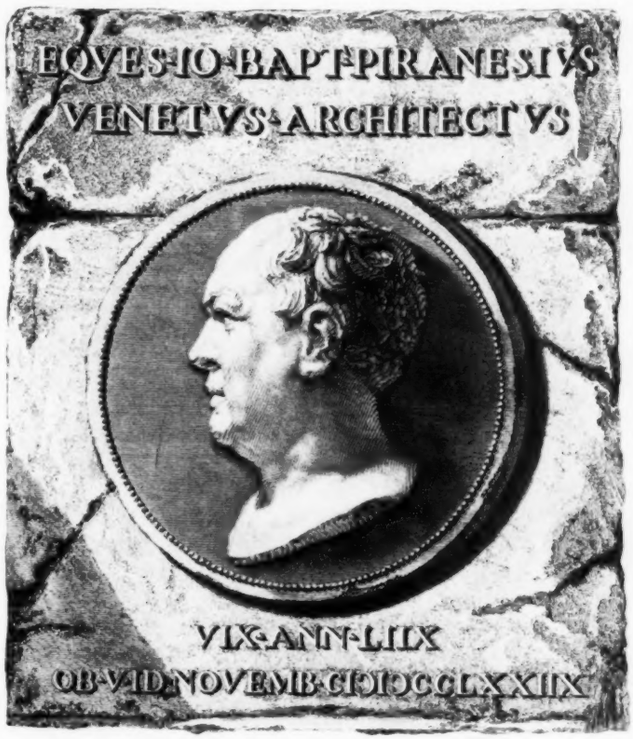
It is hoped that every reader of this publication will realize the importance of the work of this Committee and the value of Senator Calder's well known activities in behalf of the construction industry. Each reader may share definitely in bringing about better conditions not only in the building industry but throughout the architectural profession by sending to this Committee, whether solicited or not, any pertinent information.

Piranesi — Style Maker

AND SOME SUGGESTIONS AS TO HOW A GOOD BOOK MAY BE BETTER USED

By RICHARD F. BACH, *Metropolitan Museum of Art*

THE difficulty of doing some things is surpassed only by the pleasure of making the effort to achieve them. For instance, one might attempt a critical appraisal of Piranesi's work, but his fondest admirer would fall as far short of the true picture as would his sharpest foe. A giant of graphic art, "the Rembrandt of architecture," he stands above his time and compeers; however easily Michelangelo saw over the heads of his fellow carvers, Piranesi as handily outstripped other etchers and engravers of his period. His value to his own century was negligible as that century saw it (his splendid series entitled *Le Antichità Romane* brought him seventeen lire!), but as history has come to regard him, his labors have been credited not only with the greatest high-quality output that has been recorded for any man, but also as the influence which gave the requisite final impetus to the empire style; this, some claim (among them the critic R. Phené Spiers), Piranesi practically made out of hand. He succeeded, furthermore in developing within this style a Piranesi vogue of his own,—as great performers in any field are bound to do,—so that he comes dangerously near to figuring as a style "creator" or, in the expressive English of to-day's business world, a style "promoter." All the more accurately does this description apply to him in that he may be said to have launched a boom in design, especially architectural design, which appears plainly in at least one of his books, as we shall see. He disapproved of current practice, made a conscious effort to improve it by reference to better originals in antiquity and sowed a seed that multiplied beyond his wildest dreams and quite probably, in most cases, contrary to his hopes.



Medallion of Giovanni Battista Piranesi

Giovanni Battista Piranesi (1720–1778), a most ambitious Venetian, can hold the mirror to the master craftsmen of all times. A consuming creative impulse drove him to work untiringly and impetuously; sometimes, perhaps not very wisely or too well, yet in the many volumes of his work only a rare plate falls below his customary excellence in either conception or technique. A careful student has found that he produced some 2000 plates by his life-long industry or, quite accurately, one plate every fortnight of his working career.

Piranesi's mind was a combination of architectural and graphic thinking, both of such high excellence that he was willing to let neither be sacrificed to the other, and the cumulative effect was such a prodigious output that he has been suspected of maintaining a *bottega* in the nature of a factory, similar to to-day's "plan factory" of ill repute. Of this there is no proof. But the Italians have since established such a factory under royal patronage at the *Calcografia Reale* and have in dunder-headed good will reproduced from his plates, now carefully steel coated and re-etched, a myriad of seventh rate prints, clouding their author's reputation, damaging his work, and, we might almost say, really helping many architects toward higher thoughts in design because the lower price brings these prints within reach of their purses and enough of the artist's strength remains to offer no little inspiration and suggestion.

The immediate cause of these ruminations, which have been set down as they trailed one another in the course of a perusal of the work, is a volume by Piranesi, not by any means his best known, yet one of his most characteristic and direct products: it has the title *Divers Manners*

of Ornamenting Chimneys and all other Parts of Houses taken from the Egyptian, Tuscan and Grecian Architecture with an Apologetical Essay in Defense of the Egyptian and Tuscan Architecture. Its text in the first edition, which bears date of 1769, is in Italian, English and French and there are sixty-five plates. We have heard much of Piranesi's *Prisons*, his *ruins* and other collections of engravings,—which we should designate etch-engravings, for he used both processes together,—but we see only occasionally any reference to his designs for ornament. His *Prisons* or *Carcere d'Invenzione* are one hundred per cent pure imagination, his plates showing ruins at least eighty per cent so,—stage ruins we might call them, for he was a conceiver or designer of ruins as well as an engraver of them. Our scenic artists would give an eye for such a ruin as he could make out of one broken stone and a stray weed, for these would grow in his mind to hills with dismantled temples overgrown with foliage, nature's protest against their further desecration. Piranesi loved ruins, and that because, as sources of design, as fountain springs of imagination, he saw in them the beginnings of an endless procession of new form combinations. What is more, he had a profound architectural consciousness, a constructive method of thinking and of working; he found no difficulty in completing the architect's thought, as seen in the tumbled remains of his building. It is therefore to be counted our good fortune that he has left us such books as this on fire-places, in which he rides his hobby as hard as ever, but reins it in to show, in a way, that it is really a perfect horse. In the present volume he comes down to earth and does not dislike its solidity; his plates indicate such reasoning and such results, from the standpoint of practical utility, as will outweigh any distaste for his thesis.

This latter he states in his introductory pages, giving it the title of *Apologetic Essay*, a name which implies a halting "I beg you," but which conceals a stern face, a fiery temperament and the not uncertain words "I dare you."

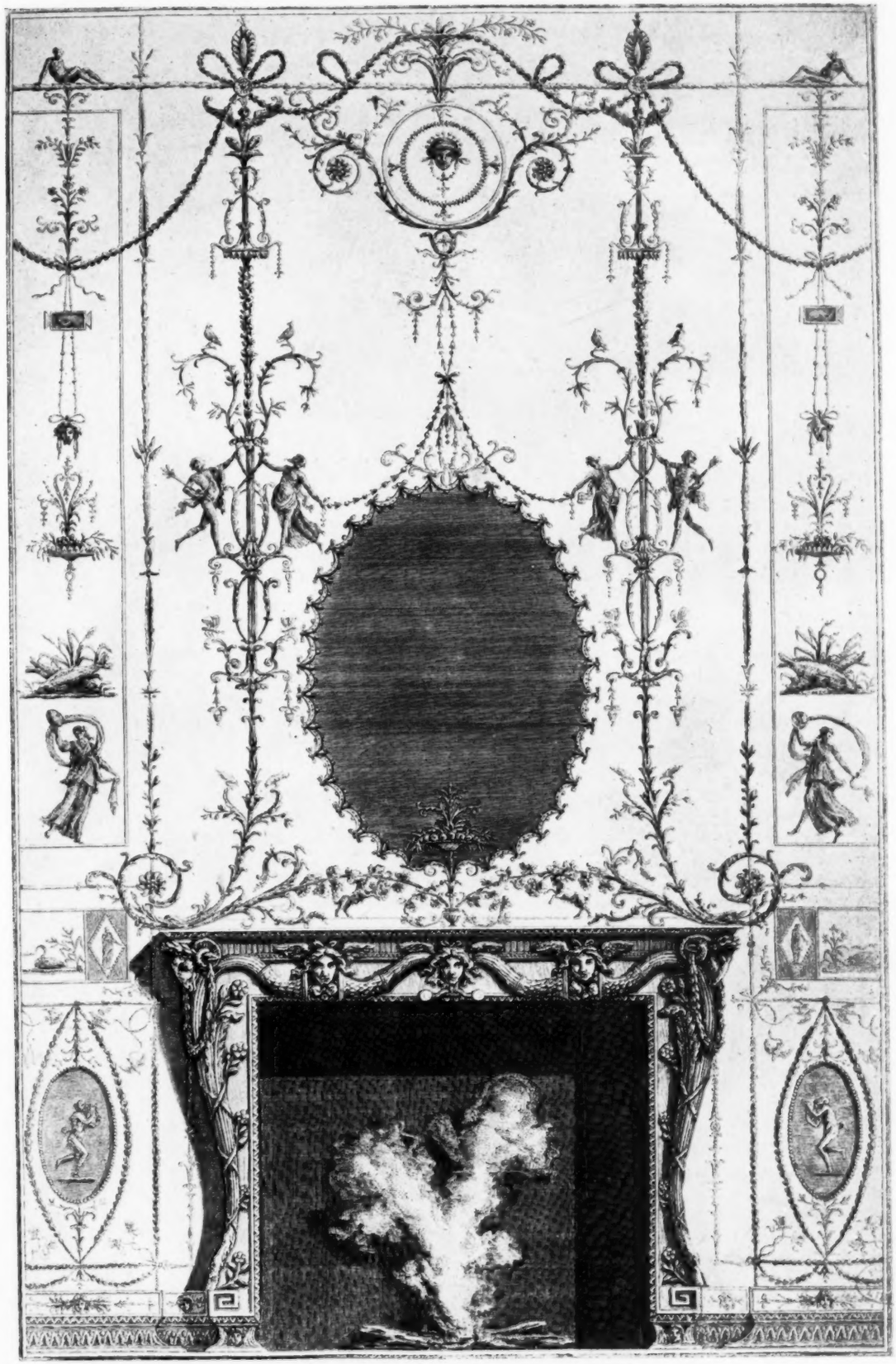
A benison on the inventor of the preface. Piranesi tells his story in his preface, which is an account, a defense, an apology, an attack—and a satisfaction. He was a plain spoken fellow and, I dare say, ready with his fists, if his style of writing is an indication of his willingness to maintain a cause. When you are through with his preface you will agree with him and vow to buy this book if it takes a life's earnings as a professional designer; or you will despise his point of view and at the same time hold on to his book for its out-and-out design value. For many a one, as for the humble writer in this instance, it will bring encouragement and admonition in a breadth, satisfaction and a compelling desire to indite without delay an *apologia pro vita sua*, as Cardinal Newman did, to set down clearly his own faith and the reasonable foundation for it, so that he himself might see it more clearly and assure himself of its convincing tone.

On this preface might be based a workable catechism, a series of leading questions answered by quotations from Piranesi and illustrated by his plates from this book. You will not always agree with him—or his renderings; you will decry his monomania but you will catch his enthusiasm, which is the burning fire of design. There are no cold blooded designers! His renderings are always fine but in modern interpretation we would miss the water color shadows that are always suffused with light, because this is the stronger and reflects when it cannot penetrate. His personality and his medium prompted strong contrasts,—flat contradictions, black on white, high noon and abysmal darkness, with solid obstructions to cut the light. It is notable that any modeling remains in his work when he favors so often a striking offset as plain as that of black type on white paper.

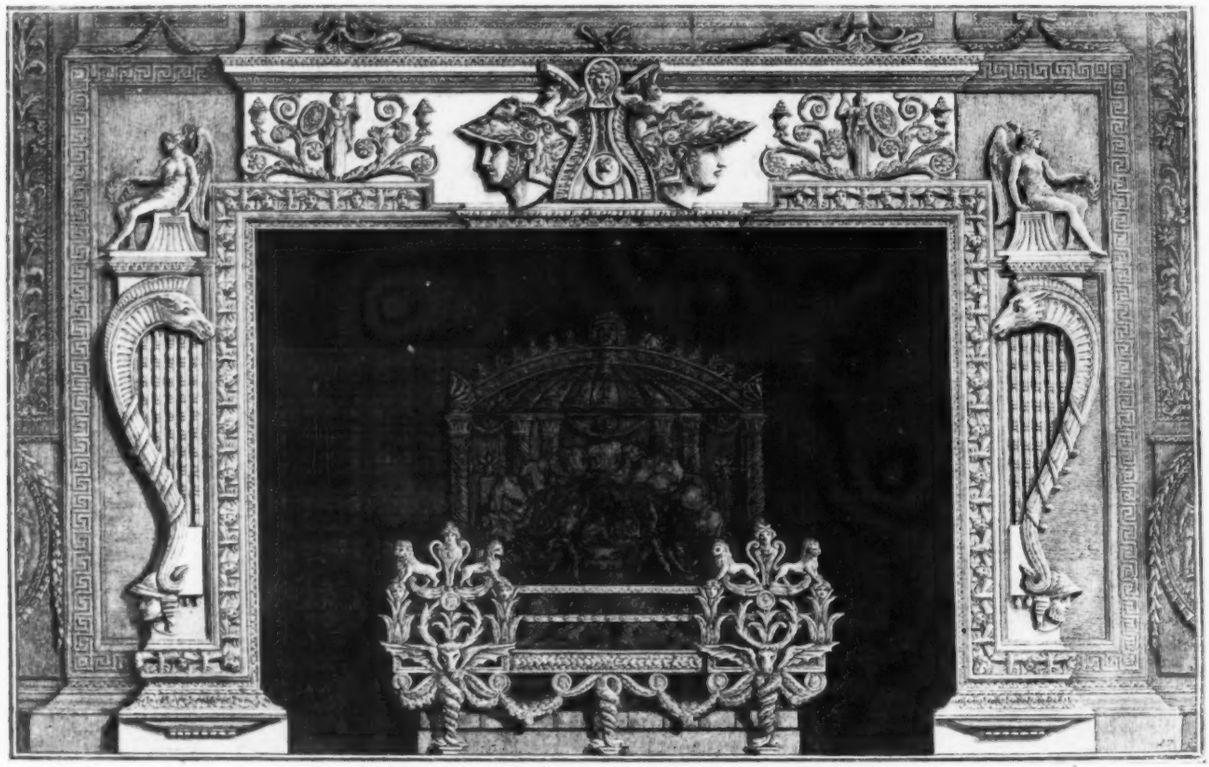
But our business is with Piranesi's text; let us read with him. First he wants to set at rest any doubt we may harbor regarding the existence of chimneys in the periods from which he draws his motives. "No one," he says, "in reading in the front of these my designs: *Divers manners of ornamenting chimneys, etc.*, will imagine that these designs which I give to the public are really taken from chimneys which were in use among the Egyptians, the Tuscans, the Greeks and the Romans; whoever should think so would be much mistaken." We are told that the author was "well apprized" of the controversy as to chimneys among the ancients and he quotes authorities. Pioneers are often naïve.

The purpose of the undertaking is then stated: "What I pretend, by the present designs, is to shew what use an able architect may make of the ancient monuments by properly adapting them to our own manners and customs. I propose shewing the use that may be made of medals, cameos, intaglios, statues, basso relievos, paintings and such like remains of antiquity, not only by the critics and learned in their studies but likewise by the artists in their works uniting in an artful and masterly manner all that is admired and esteemed in them: whoever has the least introduction into the study of antiquity must plainly see how large a field I have by this laid open for the industry of our artists to work upon; and such as have not that advantage will easily comprehend it on casting an eye over the following plates." The architect must be "able"; there is wisdom in that reservation. If he is not "able," he will not "use" the ancient monuments; he will "crib" from them. Note the inclusive lists of arts which may contribute to the architect's advancement; most of our architects barely have time (or *take* time) for an architectural periodical, let alone for a book on Greek coins or mediæval costume, or even Italian mural painting.

In succeeding paragraphs we may find a parallel



Example of a Chimney-piece with Overmantel of Pompeian Motifs by Piranesi



Fireplace of strong classic tendencies with figures and warrior heads of numismatic or cameo derivation as chief adornments. The familiar fret attributed to pre-classic days but better known as a Greek unit and the bee chosen as symbol of the Bonapartes occur on the dado and architrave

for our own day and at the same time some age-old philosophy that architects should be born with but which each learns by dint of much laborious grinding, and an appreciation of what the Japanese call the 'art of omission.' "The study of Architecture, having been carried by our ancestors to the highest pitch of perfection, seems now on the decline and returning again to barbarism. What irregularities in columns, in architraves, in pediments, in cupolas; and above all what extravagance in ornaments! One would think that ornaments are used in works of architecture not to embellish them but to render them ugly. I know indeed that in this the caprice of those, for whom the buildings are made, has often more part than the architect who makes the design. . . . A military man will have arms and instruments of war everywhere, whether they be proper or not. A sea-faring man will have ships, Tritons, dolphins and shells. An antiquarian will have nothing but ruins of ancient Temples, broken Columns, Statues of Gods, and Emperors. Let them have their will, for no curb ought to be put on such caprices of men but then let them be executed according to the rules of art. Let Tritons and fish be placed on chimneys, if it be so required, but let them not so cover the frame as entirely to hide it or take away its character. Let the architect be as extravagant as he pleases, so he destroy not the architecture, but give to every member its proper character."

Graces of architecture, yes, but they must agree with it, for the old-time requirements of decorated construction as against constructed decoration can make or break the designer, though he be architect or dramatist, painter or poet. A century later Owen Jones in his *Grammar of Ornament* makes this his Proposition One.

But there is hope if the sufferer from then current ignominious forms of design will but turn back the leaves of history to the time when the ruined buildings used as quarries all about him were the glory of the world's greatest empire. "We ought . . . to observe the kinds of ornaments used by [the ancients], the manner in which they disposed them to make them harmonise with the whole, and the modifications by which the Egyptian and Tuscan manners were adapted to another species of architecture."

And in his own time Piranesi found fault with men whose names shine forth in our architectural histories. "Some . . . who excelled in the great parts of architecture are wanting in the small ones; others have boldly raised themselves and shewed the greatness of their genius in the daring flights they have taken in imitation of the ancients, but they have not always been able to sustain themselves, but have lost sight of the antique, to give themselves up to the bad taste of the times in which they live." Palladio and Peruzzi, guides and models for the students in our schools of archi-

tecture, divine inspirers of *projets* galore, find no mercy at Piranesi's hands. They lack coherence or unity, they break the thread between the exterior and the interior. Baldassare Peruzzi, whom Vasari, chronicler of them all, called "that most excellent master," according to Piranesi "does not keep up his credit in what he proposed to himself at first." This refers in particular to the Massimi Palace in Rome, but is accompanied by such a criticism as would seem to damn much else of his.

Another lesson, then, and one of vital importance in these days when architects want to be decorators but don't know how to go about it, and when "interior decorators" by the score are doing in an inferior way what the architects' taste should readily compass. It is obvious that the decorator must know at least as much of architecture as a qualified dentist must of medicine,—though we incline to the view that a true decorator, a Pheidias or a Michelangelo, should be a sort of super-architect, so great must be his knowledge, so painstaking his restraint. Otherwise the ornament overwhelms the structure and becomes the only guide to public taste. Says Montesquieu: "A building loaded with ornament is an enigma to the eyes, as a confused poem is to the mind"; and in another place Piranesi himself has it: "I look upon the harness in which horses are nowadays wrapped up, like children in swaddling clothes. . . . The ancients practised the reverse; they wisely thought that the most beautiful ornament of a horse is the horse himself. All these trappings, however sumptuous and gaudy, load, but do not beautify the object." We find the solution in "a more profound study of antiquity [which] would have furnished these great men with a greater abundance of ideas, and the small architecture would have been of a piece with the great. If our present architects shall apply to this study, they will not need to be afraid of being upbraided for want of erudition, when called upon to work after the manner of the ancients." It is the time-old study of comparative significance of all features, of relative values, of leading lines and axes, of rhythm, proportion, movement, that the designer must make his mentor; so that "a multiplicity of ornaments" may not destroy "a graceful and pleasing disposition of motifs," and posterity will not say of his work as Piranesi did of the work of his contemporaries: ". . . but if the whole be considered, O Dio!"

But lest we carry away the impression that the ancient styles are flawless he hastens to make clear that they are for inspiration and influence only, not for sole sustenance, saying, "No, an artist, who would do himself honor, and acquire a name, must not content himself with copying faithfully the ancients, but studying their works he ought to shew himself of an inventive, and, I had almost said, of a creating Genius; . . . the human under-

Fireplace with Roman acanthus rinceau as the dominating feature. Fireback of the attenuated classic forms and dancing Naiads adopted in a large measure by the Brothers Adam in their decoration

standing is not so short and limited, as to be unable to add new graces, and embellishments to the works of architecture, if to an attentive and profound study of nature one would likewise join that of the ancient monuments . . . the vein is not yet exhausted, new pieces are daily dug out of the ruins . . . capable of fertilizing, and improving the ideas of an artist who thinks and reflects." Is this last expecting too much? Is it contrary to temperament?

Finally Piranesi throws the gauntlet, truly as a proud *romano*, though he was but a *romanesco*, having been born in Venice. "Rome is certainly the most fruitful magazine of this kind. . . . The Roman School, founded upon these monuments, will continue to be the Mother of good taste, and perfect design, which are the distinctive marks of her superiority over all others, and which bring such a number of hopeful youths from different nations into her bosom, there to learn the perfection of design." How little these things have changed! France there is and her teaching; Gothic has come and gone again as a revival, though it still lives and will continue among us, burning brightly in the hearts of some of our great architects. Other styles have flickered for a moment. But Rome, the fountain source, is with us as strongly as ever; that fire seems to be sacred, certainly to the profession here it is sacred, whatever tribute they may ungrudgingly pay to Greek and Gothic.

There is, then, a value in this folio of chimney-pieces, apart from its value as a collection of admirable engravings and as a splendid piece of typography. There is, besides these, the triple merit arising from first, its place in stylistic history; second, the mode of thought fostered by the author, *i.e.*, his attitude toward design in principle and toward historic originals (and, we may say, that in such things attitude is everything) as seen in his *Essay;* and third, the performance of the author in his plates, where he functions purely as a designer.

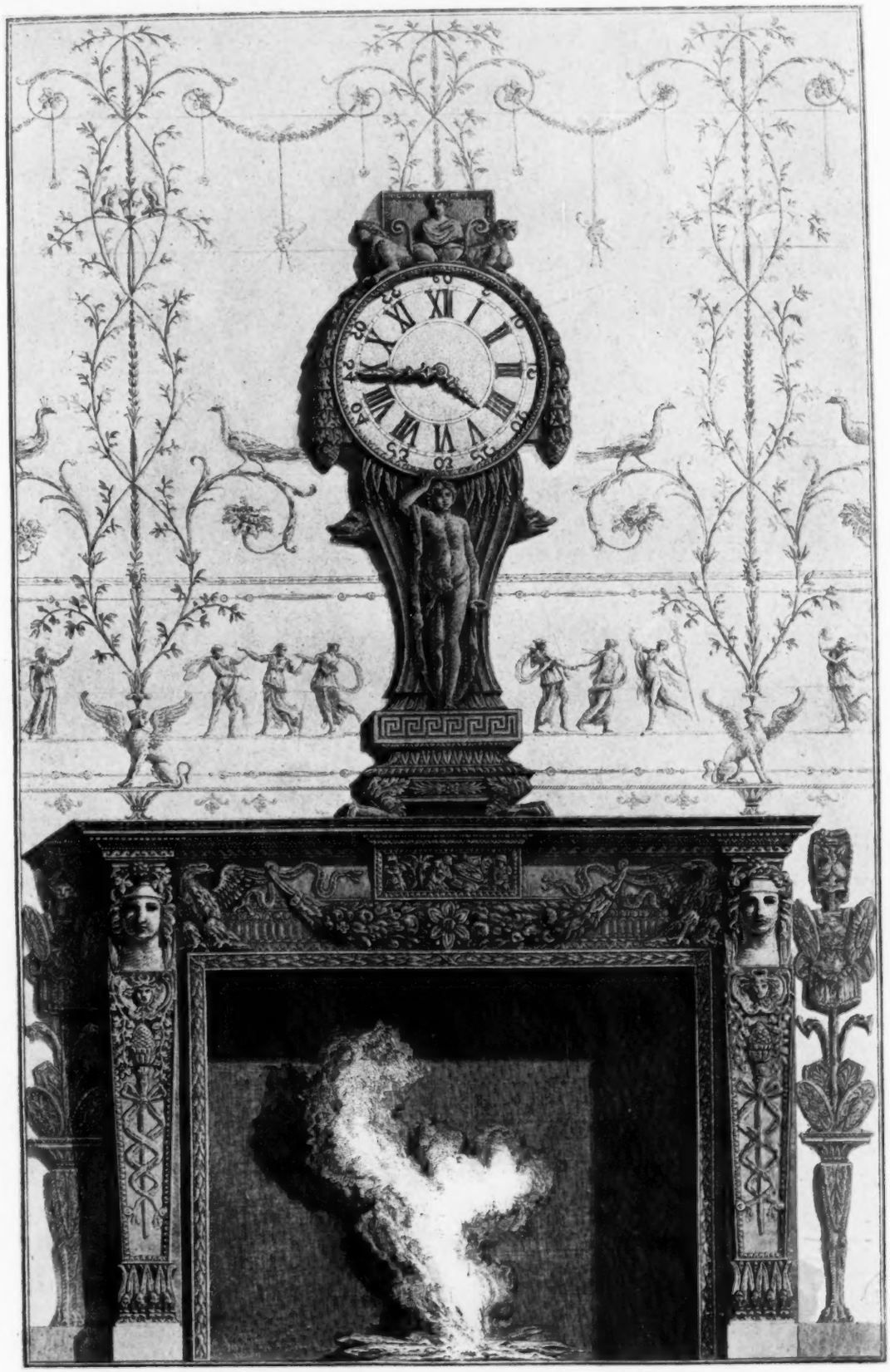
Historically the book belongs and the man belongs in the time when the realities of ancient life began to attract men who saw in the excavations and measurements of ancient monuments and other types of art possibilities for a saner outlook and respite from the vagaries, bombast, false restraint and general immorality in artistic thinking to which all the eighteenth century styles succumbed, until the same slough of despond swallowed up the empire style as well. Winckelmann was a leader among the classical students—a scholar and a pioneer but not a producing artist. His books on the criticism of antique works of art found ready response; Lessing followed him with the famous *Laokoön*. The findings at Herculaneum and Pompeii (1710 to 1750) brought ocular evidence. Everyone clamored for more facts; here was reality, splendor of true greatness—the overbearing autocracy of much of it they did not see, for it was natural to their environment. Piranesi was quick to feel the pulse of the time; in fact, it was his own pulse. Ancient Rome was to him the apex of human achievements and desires. He worked feverishly, throwing a spell over the ruins and confining their atmosphere in his numberless plates.

But as the Roman adherents grew in strength, a Greek camp sprang up. There also measurements were made; new-old things were found and published. In both peninsulas scholars and artists, architects and princes traveled, saw, wrote, and above all, met. All carried the germ back to their own countries and preached the new gospel. Books were written in number: Caylus on travels in Greece and Asia Minor, Wood on temples at Palmyra and Baalbec, Adam on Diocletian's Palace at Spalatro, Houel and d'Orville on temples in Sicily, Stuart and Revett on Athens. Among these Piranesi's work stands preëminent; he caught the imagination while others worked as archæologists purely. While they were students and worked with their pencils, he was a protagonist and fought with his burin. The Greeks had to be put down, and some believe that this book on Chimney-pieces was a counter thrust to weaken the effect of David Leroy's *Les Ruines des plus beaux Monuments de la Grèce*, published in 1758.

The cult of the ancient things grew out of all proportions. Jean François Belanger, pupil of Leroy,—refiner of Piranesi he has been called,—designed furnishings for the hôtel of Mlle. Dervieux of which Brogniart had been architect in 1774. Père Lesueur's cellule at Trinité des Monts was designed by Clérisseau in faddist classic: an entablature served as table, capitals were chairs, a Roman bath tub became a bed and for secretary a sarcophagus!

Many Frenchmen were in Rome when Piranesi was at the height of his ardent apostasy, and no small number of these, and of Englishmen as well, were kindled by his enthusiasm and took away with them the mark of his influence. Augustin Pajou was there, so also Jean Antoine Houdon, Jean Jacques Caffièri and Clodion, all sculptors; and Chalgrin, architect. Important was the *grand tour* made by Abel Poisson, brother of Mme. de Pompadour, arch style maker second to none, who was later to take up, as Marquis de Marigny, the duties of *Surintendant des Beaux-Arts*. With him in the years 1749 to 1751 traveled (as tutors we surmise), Soufflot, architect of the Panthéon, and Charles Nicholas Cochin, *fils*, engraver.

What is more, Robert Adam was himself favored with three engravings by Piranesi who also dedicated to him his work on the Campus Martius. There are in this many suggestions for the proper allocation of influences seen in Adam work in England. George Dance, Jr., architect of old Newgate Prison, distinctly was debtor to Piranesi who actually assisted him, as were also Robert Mylne, designer of Blackfriars' Bridge, and Sir John Soane



Design Showing Piranesi's Attention to Accessory Details

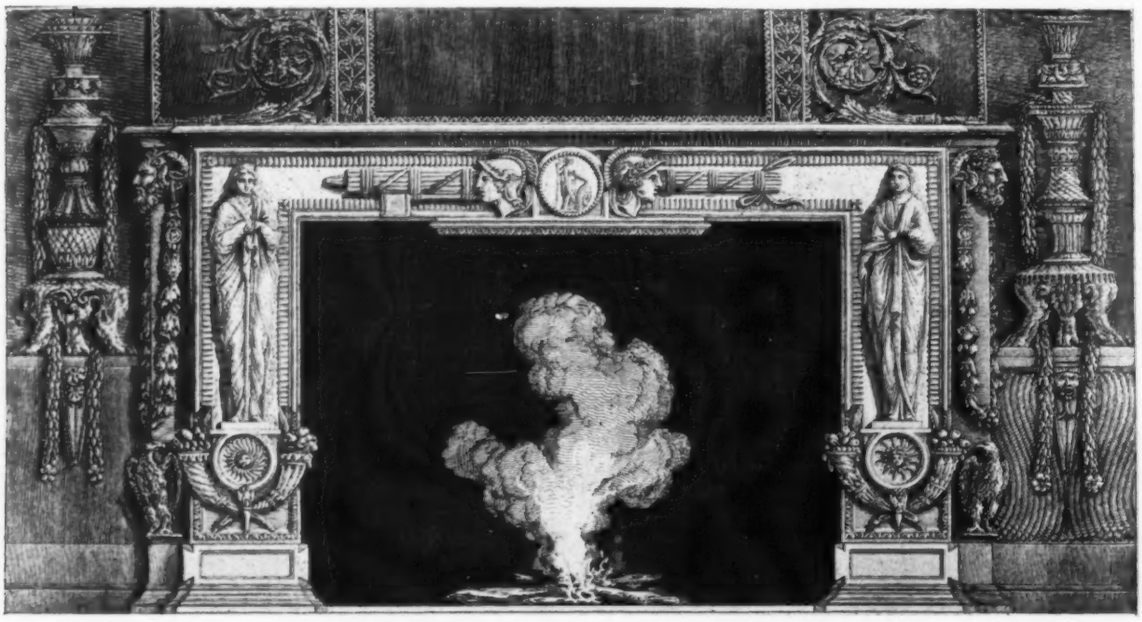
whose bank is the hub of the British Empire.

Percier and Fontaine met in Rome in 1786 and there cemented that friendship which only death severed. They spent six years in Italy. After their return to France they published *Receuil de décorations intérieures comprenant tout ce qui a rapport à l'ameublement, comme vases, trépieds, cheminées, tables, secrétaires, fauteuils, etc.* This was in the Year XI of the new order of things which followed the first break of the Revolution in France. In 1812 the book was reissued with a *Discours préliminaire*, plainly a duplicate of Piranesi's *Apologetic Essay*. This work also was a revulsion but against prevalent abuses in France, as Piranesi's had been against those of his day in Italy. By 1788 the Empire style was definitely under way and its momentum soon carried it to extremes, formal, frigid, imperial, lifeless, uncomfortable and so doomed to an early demise.

So Piranesi's work was done; had he not sought to build so fast his structure might have had a longer life. But his record was written in every country and the greatest heads bowed to his genius —but not in his lifetime. Now he is gradually attaining the position he deserves. His broad interpretation of the architect's functions, that scholarly angle toward his work without which the architect's vision is limited, these he possessed in admirable proportion.

It is rarely given to one man to create a style, but an occasional wonderman strikes close to that mark. Such a wizard was Piranesi, as is seen in the book which has prompted these effusions. It is an argument for sanity rather than suavity, sincerity not subtlety, vigor and virtue, not fervor and fustian. In closing his *Essay* Piranesi says: "I hope that many will consider themselves debtor to me for this labor: but I do not flatter myself that I shall escape the censures of many others who, by reason of an inclination to criticism, or a turn of mind never to be satisfied, find fault with everything. . . . But there are sometimes reasonable and discreet critics who, out of a love to truth, and for the public good, make use of that equitable freedom, which every man has, of examining whatever is exposed to public view, of exposing its defects and making out its imperfections. To despise the opinions of such, would be a self-sufficiency and presumption not to be suffered." Need more be said?

Old books need not be good books, but a good old book is a blessing.



An elaborate ensemble of familiar Roman fragments with an alternative arabesque arrangement at either side typical of Piranesi's facile delineation

The Automobile and the Private Estate

PART V (CONCLUDING PAPER). SERVICE COURTS, PARKING SPACES AND GARAGE LOCATIONS

By TYLER STEWART ROGERS

IN the design of service courts utilitarian considerations take precedence over appearance. Economy of space is generally of first importance with economy of cost a close second. Aesthetic satisfaction is often placed last, and such decoration as may be undertaken is frequently only in the nature of carrying out the motif of the whole in the details of the unit.

Economy of cost calls for minimum area of road surface, minimum length of enclosure, and the least possible waste of space. Economy of space is insisted upon, aside from its tendency to reduce cost, in order to utilize as much as possible of the property for more interesting purposes.

Service courts may be grouped into three general classes: (*a*) those adjacent to the service part of the residence and used mainly for the delivery of supplies, which might be called kitchen courts; (*b*) those adjacent to the garage used principally for turning cars about on entering or leaving the garage, which might be called garage courts; and (*c*) those so located as to combine the functions of both kitchen and garage courts, for which no better name suggests itself than general service courts.

Within each of these classes there are three types of service courts, as defined by the method of performing the turn. The first type is the simple loop around which vehicles pass in a continual, progressive movement. The second type includes all courts of such size or shape that vehicles cannot move about the court in a progressive direction, but must back one or more times. For want of a more euphonious name which is equally descriptive these will be called "backing" courts, and the type subdivided according to the number of times a vehicle must go backwards in order to negotiate the turn. The third type is again a combination of the two preceding types.

The loop is the most satisfactory and simple form of turnaround of the three. Its sole disadvantage is that it requires more space than a "backing" court. Except for this matter of space it would be the only type necessary. If the center of the loop is left open, either as pavement or as unobstructed turf, it serves both as a loop for ordinary cars or for trucks within the size for which it was designed, and also as a backing court for trucks of unusually large size.

The shape of a loop has been discussed in Part IV in connection with the designing of forecourts. The simple loop (that is, one without provision for stopping places) is sufficient for ordinary service purposes, for there is seldom any necessity for bringing the vehicle close to a step or curb. If the occasion arises for stopping parallel to and close against a curb or step, it may be done by backing, without frequently inconveniencing anyone.

Size is determined largely by the use of the service court, whether it is intended for a limited class of automobiles or trucks, or for general use by large and small vehicles, and whether for occasional cars or for heavy, continuous and fairly rapid traffic. A service court for a factory, a public garage or a farm would probably be much larger than one for a private estate. The owner's passenger automobiles and merchants' delivery trucks comprise the great majority of vehicles using a private service court and it is the characteristics of these vehicles which govern its size. Merchants' delivery trucks are generally of light weight, of fairly short wheelbase, and of good turning ability. Pleasure vehicles using the service court are apt to be of all sizes, and provision should be made for the largest kinds in order to accommodate guests' cars if not the owner's. The general dimensions of delivery trucks and passenger vehicles are quite similar, as may be seen by this table:

	Light Delivery Trucks		Passenger Automobiles	
	Minimum	Maximum	Minimum	Maximum
Turning radii	18′ 0″	25′ 0″	15′ 0″	29′ 6″
Wheelbase	8′ 1″	11′ 1½″	8′ 3″	12′ 3½″
Length	12′ 9″	17′ 1″	11′ 2½″	18′ 4″
Width	5′ 4″	5′ 8″	5′ 4″	6 0″

Service loops, therefore, should be designed to handle vehicles having turning radii of from 25 ft. 6 ins. to 30 ft. Very heavy trucks have much greater turning radii, some being reported in excess of 50 ft., but these trucks are so seldom encountered that their occasional use of the court need not be considered, provided open space is allowed for them to back around. Backing turns involve a totally new problem, due to the mechanical construction of automobiles. As previously explained, the center of a circle described by an automobile is on the line of the rear axle extended. Consider what effect this has on the backing of a car.

When a car is being backed around within a restricted area the driver turns his wheels before putting the car in motion. The front wheels being set at a fixed angle the car then describes the arc of a circle. When a car which is moving forward is swung into a turn, however, it describes a curve similar to a parabola until the maximum angle of the front wheels is reached. Bearing these factors in mind the development of the accompanying diagrams is easily understood.

Fig. 1 shows the path of a car which turns by backing once, the backward motion being taken after the car has been brought to a stop without change from its original direction of travel. The arrows are marked F for forward and B for backward motion. The letters X and Y indicate respectively the minimum radii of the outside front wheel and of the inside rear wheel, and W indicates the wheelbase. It will be noted that the width of the space required to turn the car is theoretically the length of X.

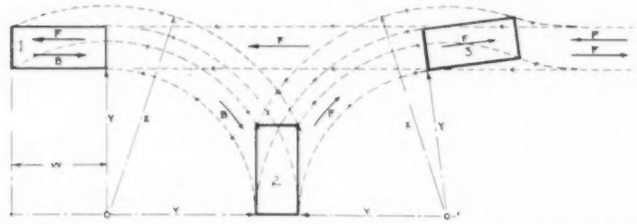


Fig. 1

Compare this turn with Fig. 2 which shows the path of an automobile which swings off the direction of original travel for its first movement and then backs around. In this case the width of the space required for turning is much greater, being equivalent to X plus W plus slight correction due to the parabolic shape of the entering curve.

These two diagrams show the nature of the backward movement of a car. It has often been said that a car can back in a smaller circle than it can negotiate in a forward direction. The fallacy of this is obvious, yet the two diagrams show the probable origin of the notion. The truth is that a car can be turned with less backing in a narrow road if it makes its first movement across the road *backward* (as in Fig. 1), than it can if it swings across the road forward and then backs around (as in Fig. 2).

The shape of backing turns is governed by (*a*) the direction from which the backing is commenced, and (*b*) by the number of backing movements made. A car may back once, twice, three times or often more; and the space needed for each turn is less for the greater number of backings. Fig. 3 shows the shape and size of the space covered by an automobile turning by backing thrice. The actual path of the car is shown by the dotted lines, and the consecutive numbers indicate the various forward positions which the car may reasonably be expected to occupy.

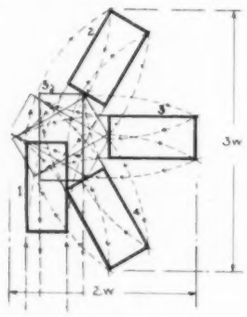


Fig. 3

The third type of backing turn is a combination of the other two, and is generally encountered when a loop is used directly in front of a garage. This type is shown in Fig. 4.

Solutions to all turning problems may be found by varying these types of turns or by combining them to meet the specific conditions in mind. A few examples may be helpful.

The suburban garage in a restricted area sometimes is on a shallow lot which requires the least possible length of drive and backing space. In this case Fig. 2 gives the proper shape of turn, the owner being obliged to turn and back into his garage. On the other hand a narrow deep lot may require the use of the type shown in Fig. 1, in which case the car is always run directly into the garage and turned when it is backed out. By such economies and restrictions turns can be provided in surprisingly small and otherwise unused areas that occur in the layout of a plot.

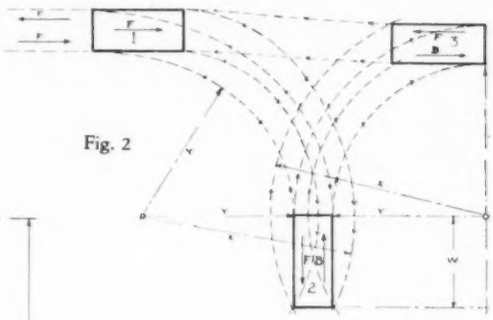


Fig. 2

When the approach to the garage is parallel to the front of the garage several variations of the problem may be possible. If the driveway is far enough away from the entrance to the garage, a turn similar to Fig. 5 may be used. Slight economies in length or width may be effected by distinguishing between the manner of making the turn, as shown in Figs. 1 and 2. When the drive is close to the garage entrance the car must always be backed once on both entering and leaving as shown in Fig. 6. The road may also approach the garage from the rear, parallel to one side of the building, when a shape similar to that shown in Fig. 7 is suggested.

When a large garage accommodating a number of cars is considered, the problem is not altered in principle. It is necessary to plot the path of each car in order to determine the shape of the drive. Occasionally the varying sizes of the cars occupying the garage may be used to advantage. An electric runabout or a small car may be placed in the stall requiring the sharpest turning, while the larger cars are given stalls where their greater turning

radii are allowed more room.

Kitchen courts are best served by loops or by simple backing turns. Garage courts are either backing turns or combination turns. General service courts are best served by a combination turn or otherwise by a backing turn. Care in designing garage turns is advised in order that space be allowed to clear the garage doors before a sharp turn is made, unless it is possible to establish the width of the doors so that cramped quarters will not mar the success of the design. Projecting doors require additional width of turning space.

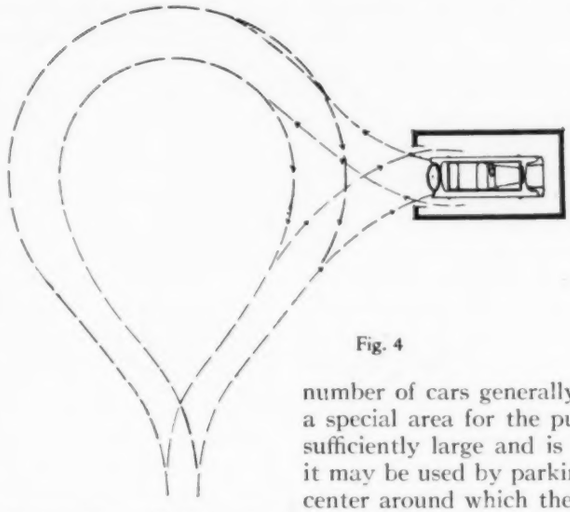


Fig. 4

Parking space for guests' cars or for the owner's cars when out of the garage is a very valuable and convenient detail which is too seldom considered. The usual approach to an estate quickly becomes congested if one or more cars are left standing in the roadway, making passage for other vehicles difficult. Some space should always be provided for the use of standing automobiles, if it is nothing more than a piece of lawn adjacent to the driveway. Such use of good turf is extravagant in maintenance costs and could well be avoided by the inclusion of an appropriate area for this special purpose in the original design of the driveway system.

One reason for the necessity of such parking space is the owner's desire to keep a car near his front door for personal use at any time. This may be provided by liberally widening the driveway immediately in front of the door or by providing an extra width of pavement elsewhere within the forecourt. The demand for this convenience is so nearly universal that it may almost be stated as a requirement in forecourt design. A width of 15 ft. in the pavement opposite the doorway is generally the minimum and care should be exercised to see that it is possible to drive into this parking space without backing and also that the space is long enough to accommodate the car without blocking the rest of the roadway. This space will also provide for the occasional caller whose car could only be driven elsewhere at some inconvenience.

Parking space for a number of cars generally requires the provision of a special area for the purpose. If the forecourt is sufficiently large and is paved over its entire area it may be used by parking the cars in a row in the center around which the moving vehicles circulate as if the center were not paved. At a Massachusetts country club this principle has been elaborated by the designers. The entrance loop has been greatly enlarged and the center part planted with a high shrubbery border shaped like a horseshoe. The open end of the horseshoe is away from the clubhouse, towards the line of approach. Cars follow the drive to the door and, after depositing their passengers, continue half way around the turn to the opening in the hedge. Within the enclosure there is space sufficient for parking a large number of cars within very easy access of the clubhouse, but entirely screened from view. A footpath from the entrance of the house through the shrubbery makes it easy for a driver to rejoin his party or to get his car without a long walk.

Occasionally the service court is available for emergency use when numerous guests are to be accommodated. When near the residence this area is often entirely satisfactory for such use, and it may even be enlarged for the purpose.

If conditions do not warrant the use of either the forecourt or the service court for parking a special area must be provided, the size depending on the probable number of cars to be accommo-

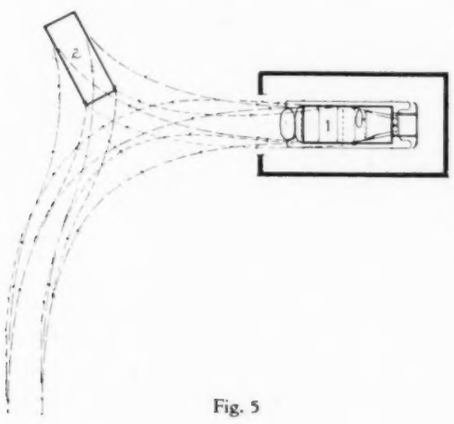


Fig. 5

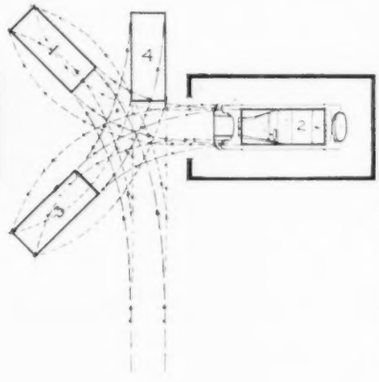


Fig. 6

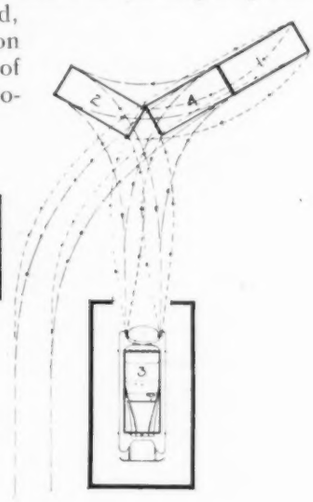


Fig. 7

dated. Large estates where frequent entertainments on a large scale are given need an area sufficient for 15 or more cars. Such space is conveniently constructed by widening a section of the roadway an extra 15 or 20 ft. for a short distance. Cars can be parked in this space diagonally to the edge of the road in the manner customary in many wide city streets. Often it is better to make a separate court for the parking of cars, entered by a branch from the main road. This scheme has certain æsthetic advantages over the abrupt widening of the roadway, as well as making it possible to keep the chauffeurs together in a place well screened from the eyes of the guests. Unless this parking space may be close to the owner's garage, in which the chauffeurs could be sheltered in severe weather, a small heated building provided with toilets would be very desirable to complete the scheme.

No problem more often confronts the designer than that of properly locating the garage. Of recent years the garage has been admitted to the sanctum sanctorum, becoming an integral part of the house itself. No other location is so convenient to the owner who drives his own car, and frequently no other arrangement is so economical in cost and in the ease with which the garage is heated during winter weather. It is generally located in the basement of the residence or beneath a porch or terrace, when sloping ground offers the opportunity. Otherwise it crops out as a modern modification of the familiar carriage sheds which are often found joined to the fine old farmhouses of the country.

Garages beneath the house have certain disadvantages to be balanced with their qualities of convenience and economy. In the first place the location introduces a fire hazard which must be reduced to a minimum by safe construction. Then, too, it brings close to the living quarters the undesirable odors of raw and burning gasolene and oil, and the noise of starting motors, air compressors and mechanics' hammers. Perhaps the chief objection to placing a garage in this position is that this location makes necessary the use of land very close to the residence for the garage court, which results in occupying areas frequently more desirable for other uses. The low grade sometimes introduces drainage problems of material consequence.

When the garage is constructed as a wing or addition to the house it is less difficult to manage it properly and most of the objections just noted are lessened. For the owner-driver there is often no better solution to the garage problem on a small estate.

Detached garages are sometimes inconvenient for the owner-driver, and are more expensive to build and heat than either of the types which have been described. On the other hand, fire risks are reduced to a minimum and the annoyance of motor noises and odors is largely eliminated. The garage court is generally improved because more space may be given to it.

Difficulties of heating the detached garage are not so great now as formerly for numerous types of small heating units are now available. Heat may be economically conveyed from the plant in the residence for a considerable distance to the garage, or the arrangement may be reversed and the nuisance of a heating plant within the residence itself eliminated by combining the garage with a central heating plant. This is advantageous when greenhouses, servants' quarters, stables and other service buildings are grouped with the garage at a point some distance away.

Most private garages now are provided with underground gasolene storage tanks. The tank should be located outside the walls of the building, near the driveway so that supply trucks may reach the filling pipe without backing across a planted area. Gasolene will kill plants and even mature trees succumb in a few years to continued exposure to gasolene, due to leaking tanks or to drains from garages. This destructive effect of gasolene is seldom appreciated, yet it is so important as to warrant special precautions if fine trees are jeopardized by the location of a garage or filling station near them. Drains from the garage should be carried away from the trees as far as possible and tanks should be well underdrained to avoid saturation of the ground near the surface.

Turntables have not been mentioned in this discussion as means for handling cars in restricted areas but a word about them may not be amiss. They are seldom satisfactory for outdoor use for ice, snow and even dirt will put them out of commission. Their real usefulness is restricted to indoor areas, and generally to large public garages at that. Even here they are being supplanted by small caster-wheeled portable trucks.

This discussion of automobiles in their relation to private estates has been prepared more with the desire of calling attention to the problems introduced by this new and very popular vehicle than of solving these problems by infallible rules of design. It is our hope that more attention will be given to this subject by professional men so that eventually all designers will be equipped with principles and rules to guide them in the solution of problems presented by the constantly increasing use of the automobile.

Sprinkler Installation for Fire Protection

PART II—SPACING OF LINES AND HEADS

By W. D. BROWN, C.E.

FOLLOWING an examination of several forms of sprinklers in the previous article and some considerations of their use, there comes the important matter of the location of the sprinkler heads.

The distance from wall or partition to the nearest sprinkler should not exceed half the allowable distance between sprinklers in the same direction. Additional sprinklers may also be required in the narrow pocket formed by bay timber or beam and wall.

The inspection department sometimes permits blocking this space by boarding from the under side of the beam to the wall, or where no inflammable material is stored close to the ceiling and the construction is fire resisting, a sprinkler is usually waived by the authorities.

A line of sprinklers should be on each side of a partition; cutting holes through, or slatting a partition to allow sprinklers on one side thereof to distribute water to the other side, is not sufficient.

FOR MILL CONSTRUCTION—Under mill ceiling (smooth, solid plank and timber construction, 5- to 12-foot bays), one line of sprinklers should be placed at the center of each bay and the distance between the sprinklers on each line should not be more than:

8 feet on centers in 12-foot bays
9 feet on centers in 11-foot bays
10 feet on centers in 10-foot bays
11 feet on centers in 9-foot bays
12 feet on centers in 5- to 8-foot bays

Ceilings of modified mill construction having bays of less than 3 feet should be treated as open joist construction and sprinkler heads spaced accordingly.

Bay timbers spaced 3 feet or more on centers, but less than 5 feet on centers, will require special ruling. (See Figs. 3 and 4.)

FOR JOIST CONSTRUCTION—Under open finish joist construction, the lines should be run at right angles to the joists and the sprinklers "staggered" on adjacent lines. Have the distance between sprinklers not exceeding 8 feet at right angles to the joists or 10 feet parallel with joists, the end heads on alternate lines being not more than 2 feet from wall or partition. (See Fig. 2.)

AN EXCEPTION—An exception may be made to this rule *if the conditions warrant*, viz.: *special permission* may be given to install but one line of sprinklers in bays 10 to 11½ feet wide on centers. In all cases where such bays are over 11½ feet wide, two or more lines of sprinklers should be installed in *each bay* as required by the rules for spacing. This does not apply where beams are flush with the joists, in which case sprinklers may be spaced as called for in "joist construction." Where this permission is given, the sprinklers should be placed closer together on a line so that in no case will the area covered by a single sprinkler exceed 80 square feet.

FOR SMOOTH FINISH AND FOR SHEATHED OR PLASTERED CEILINGS—Under smooth finish, sheathed or plastered ceilings, in bays 6 to 12 feet wide (measurement to be taken on centers of any drop beams forming the bay), one line of sprinklers should be placed at the center of each bay, and the distance between the sprinklers on each line should not exceed: 8 feet in 12-foot bays; 9 feet in 11-foot bays; 10 feet in 6- to 10-foot bays. Bays in

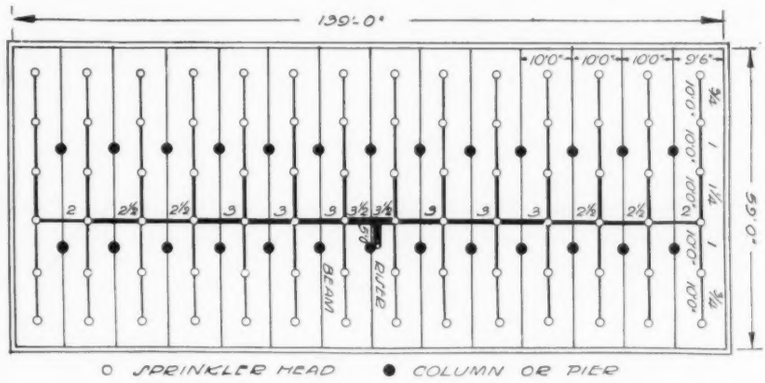


Fig. 1. Sprinklers Located under Mill Construction

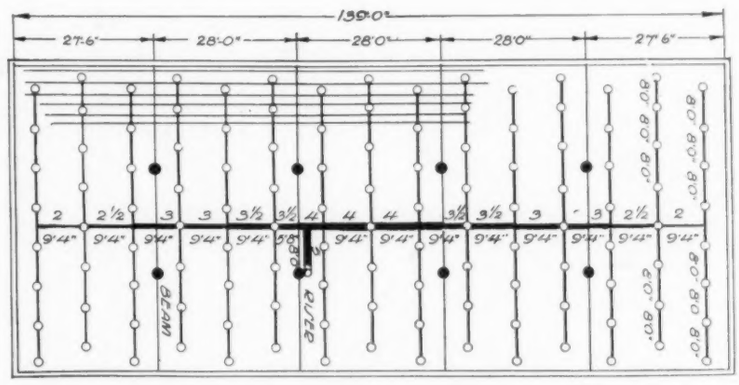


Fig. 2. Sprinklers under Joist Construction. Heavy Lines are Feed Mains and Light Lines are Branch Lines or "Stringers"

excess of 12 feet and less than 23 feet in width should contain at least two lines of sprinklers; bays 23 feet in width or over should have the lines therein not over 10 feet apart. In bays in excess of 12 feet in width not more than 100 square feet of ceiling area should be covered by any one sprinkler.

In no case should a sprinkler spacing exceed 10 feet on center at right angles to direction of joist.

For Pitched Roofs—Under pitched roofs sloping more than 1 foot in 3, sprinklers should be located in peak of roof, on either side of peak and spaced according to requirements just given. Distances between sprinklers should be measured on a line parallel with rafters. Where the roof meets the floor line, sprinklers should be placed not over 3½ feet from the intersection. Sprinklers not more than 2½ feet distant each way from the peak of roof, measured on a line with the roof, may be used in lieu of sprinklers located in peak of roof.

For Fire-Resisting Construction—The rules for slow-burning construction should apply as far as practicable, however, the purpose being to arrange the spacing of sprinklers to protect the contents of a building, but in no case should a sprinkler on a line be more than 12 feet from the nearest adjoining head.

For Unusual Construction—Special instructions should be obtained from the inspection department having jurisdiction relative to the location of sprinklers under floors and roofs of semi-mill, panel or other unusual forms of construction which may interfere with distribution of water. These types of construction are so varied that no absolute rules can be given to cover all cases.

"Semi-mill" is the term here applied to plank and timber construction with narrow bays generally less than 5 feet in width.

"Panel" construction is where the ceiling is divided by the timbers into panels or pockets. Narrow bay panels come under the head of "semi-mill" construction.

Sprinkler lines usually run at right angles to the timbers, with heads staggered under alternate timbers, in alternate bays, or alternately under the timbers and in the bays, the arrangement depending on the width of the bay, the size of the timbers and the distance between supporting girders, as well as upon the occupancy and water pressure.

Ordinarily, where the timbers are not larger than 6 x 10, the best distribution is obtained by placing the heads under the timbers.

The distance between lines will depend somewhat upon the distance between the girders supporting the timbers, the number of lines in these transverse bays being governed largely by the distance between the heads on the lines. Figs. 3 and 4 show spacing of automatic sprinklers under two types of semi-mill constructed buildings.

Pipe Size Schedule—In no case should the number of sprinklers on a given size pipe on one floor of one fire section be more than

¾ inch pipe	1	sprinkler
1 " "	2	sprinklers
1¼ " "	3	"
1½ " "	5	"
2 " "	10	"
2½ " "	20	"
3 " "	36	"
3½ " "	55	"
4 " "	80	"
5 " "	140	"
6 " "	200	"

Where cross mains supply branch lines of only two sprinklers each, the conditions approach those of long single lines. Such feeds should usually be centrally supplied where there are over eight or ten branch lines. Lines up to fourteen in number may be fed from end, provided that 2½-inch pipe does not supply more than sixteen sprinklers.

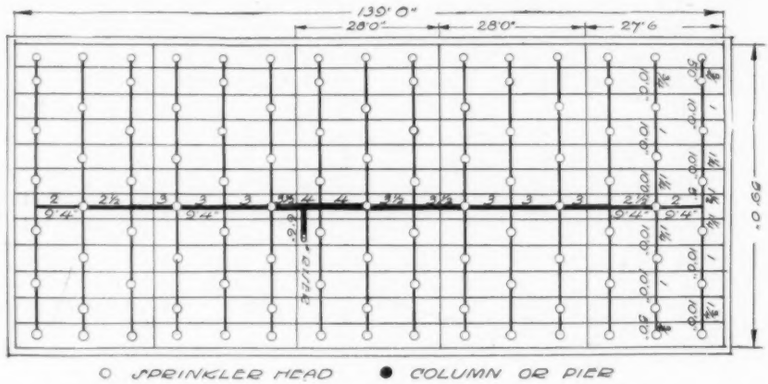


Fig. 3. Sprinklers under Semi-Mill Construction in Alternate Bays

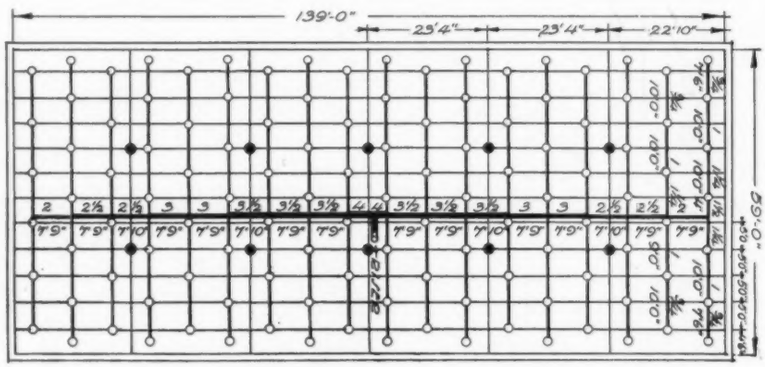
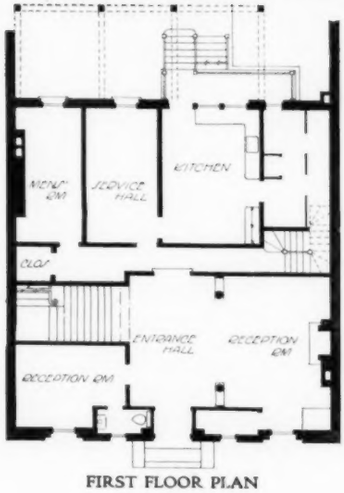


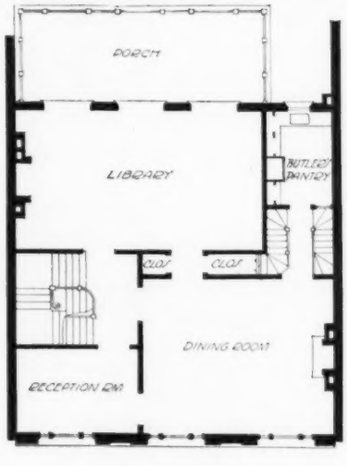
Fig. 4. Sprinklers Located in Semi-Mill Construction under Alternate Timbers. Riser Indicates Vertical Supply to Mains

House of Mrs. Theodosia Pleadwell, Washington, D. C.

CLARKE WAGGAMAN, ARCHITECT



FIRST FLOOR PLAN



SECOND FLOOR PLAN

THIRD FLOOR PLAN

EDITORIAL COMMENT

ARCHITECTS AND ENGINEERS

THE relation of the architectural and engineering professions whose work lies along similar lines and often overlaps is a subject of interest that comes up in various sections of the country quite frequently. With the increasing amount of legislation affecting the registration of architects and also of engineers, there are occasional efforts made to obtain an agreement on conditions and request joint registration acts. On the whole there is no special advantage to either profession in joint registration, but getting together to discuss its possibilities has a definite advantage in that it enables the professions to acquire more intelligent and comprehensive ideas of their respective obligations to the public.

If the two professions stand apart and carry through programs with entire independence of each other it is but natural that misconceptions should arise. Last spring there was a good deal of criticism by engineers of the appointment of a firm of architects to design a Pittsburgh bridge, and two engineering societies, the American Institute of Consulting Engineers and American Society of Civil Engineers, passed resolutions condemning the employment of architects except in an advisory capacity on bridge design. At a joint meeting of the A. I. A. Committee on Engineering Co-operation and a Committee of Engineering Council, there was full opportunity to present the necessity of architectural design in such important civic structures as bridges, and the result was a report which recognized the fundamental importance of both engineering and architecture in bridge design and stated that it was an administrative detail of relative unimportance to determine which profession was given chief supervision.

Perhaps the most significant recent happening is the proposed State Federation of Engineers and Architects in Minnesota. On June 19 representative architects and engineers from the state met at Duluth and took the first steps toward forming a State Federation. They jointly realize that only by a combination of forces will either architects or engineers have sufficient power and weight of numbers behind them to force attention to matters of public concern having to do with engineering and architecture or with the regulation of affairs affecting the joint interest of these related professions.

It is not the purpose of the Federation to supplant any existing organization, and this is borne out by the name of the proposed association. No one will be eligible to membership except through membership in his local organization. Thus in addition to promising a large body of intelligent and scientifically trained citizens who will exercise a beneficial effect on public opinion, it provides an added stimulus to the Minnesota Chapter of the Institute in increasing its membership as it does likewise to engineering societies. The separate organizations will retain all of their present independent character and are free to carry on such work locally as they may determine.

A committee comprised of the present Joint Engineering Board and one member from each of the societies represented at the meeting was delegated to draw up a constitution for the new organization. The method of determining how the board of directors shall be elected by the constituent societies has been wisely left to the consideration of the committee.

One of the immediate reasons for advocating the formation of this Federation is the movement for state licenses for architects and engineers in Minnesota. A meeting of the Joint Engineering Board was held just previous to the organization meeting of the Federation to discuss and adopt the form for a proposed license law that would include both architects and engineers. After a long discussion, the program was laid aside and it was agreed to have a committee appointed, consisting of three engineers and three architects, to draw up a bill, or bills, covering the licensing of architects and engineers, the choice of which was left entirely to the committee. The broad principles of the Federation are indicated by the fact that it recognizes the recommendation of the committee, equally divided as it is between the professions, will prove the most satisfactory solution, and it is ready to utilize its full power in backing up the request for licensing legislation whether in the form of one or two bills, when it is presented to the legislature this fall.

This character of co-operation is constructive and will result in good for both professions. It enables engineers to realize that architects are not putting forth a model for registration law that would prevent engineers from designing buildings. It brings to engineers some knowledge of the affinity of architecture to history and the cultural development of a people. Architects will learn, on the other hand, of the highly valuable inventive qualities of the engineer, the precision and utmost respect for accuracy which renders his service of such wide use to mankind. When these professions meet on a common ground of providing unselfish service to their fellow citizens, there will result only the greatest mutual respect.

The fundamental requirements for architectural and engineering training differ to a considerable degree; the ways in which they approach their respective problems are different and it is difficult to adopt one set of regulations that would fairly determine the qualifications for practice of the respective professions. Separate registration laws will undoubtedly work to the best advantage of both, yet the two professions must combine their efforts frequently. This requires intelligent co-operation and every opportunity should be utilized to bring this about through the common ground of public service to which both should heartily subscribe.

VIEW OF ENTRANCE FRONT

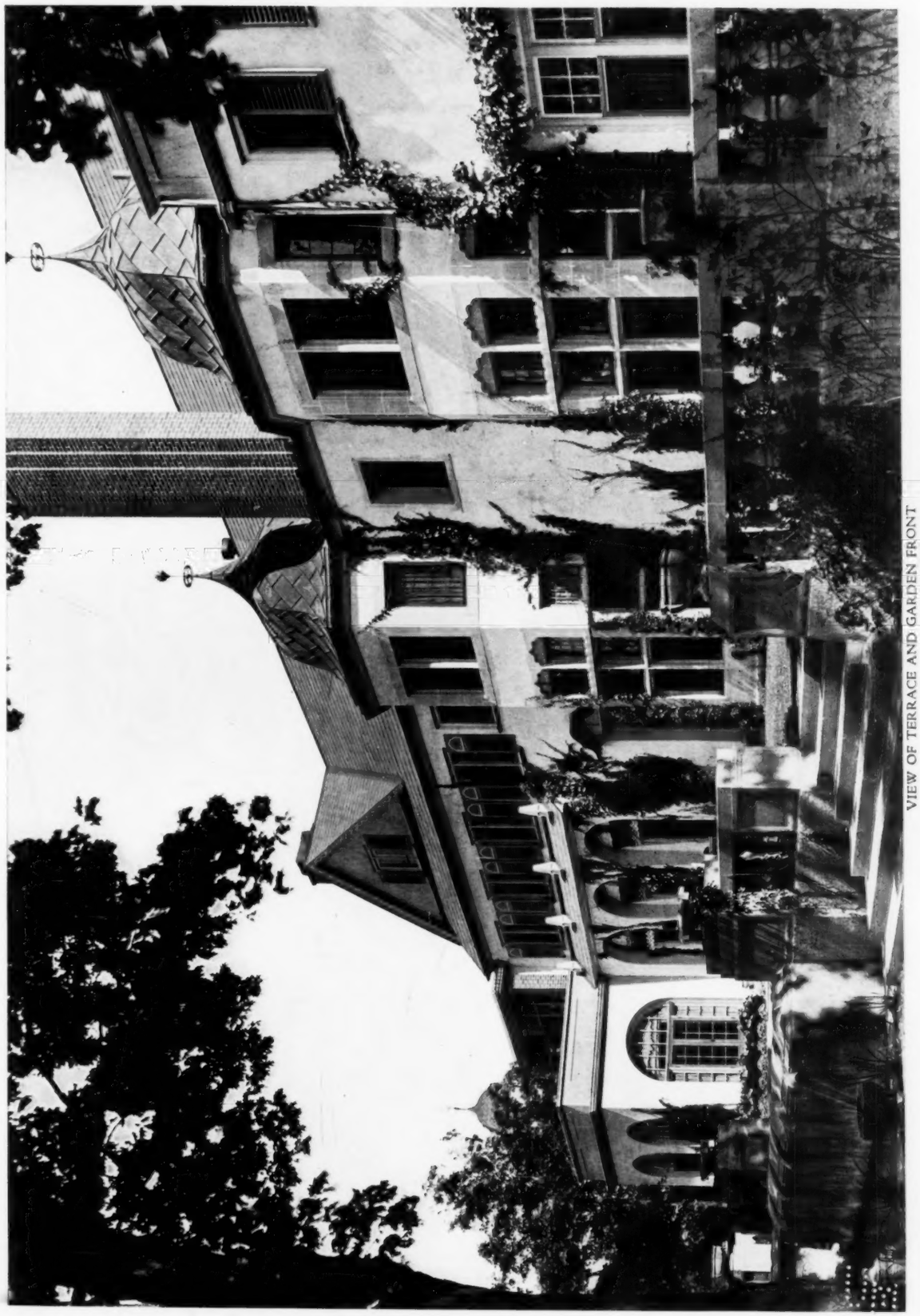
HOUSE OF WILLIAM V. KELLEY, ESQ., LAKE FOREST, ILL.

HOWARD SHAW, ARCHITECT

DETAIL OF ENTRANCE

HOUSE OF WILLIAM V. KELLEY, ESQ., LAKE FOREST, ILL.

HOWARD SHAW, ARCHITECT

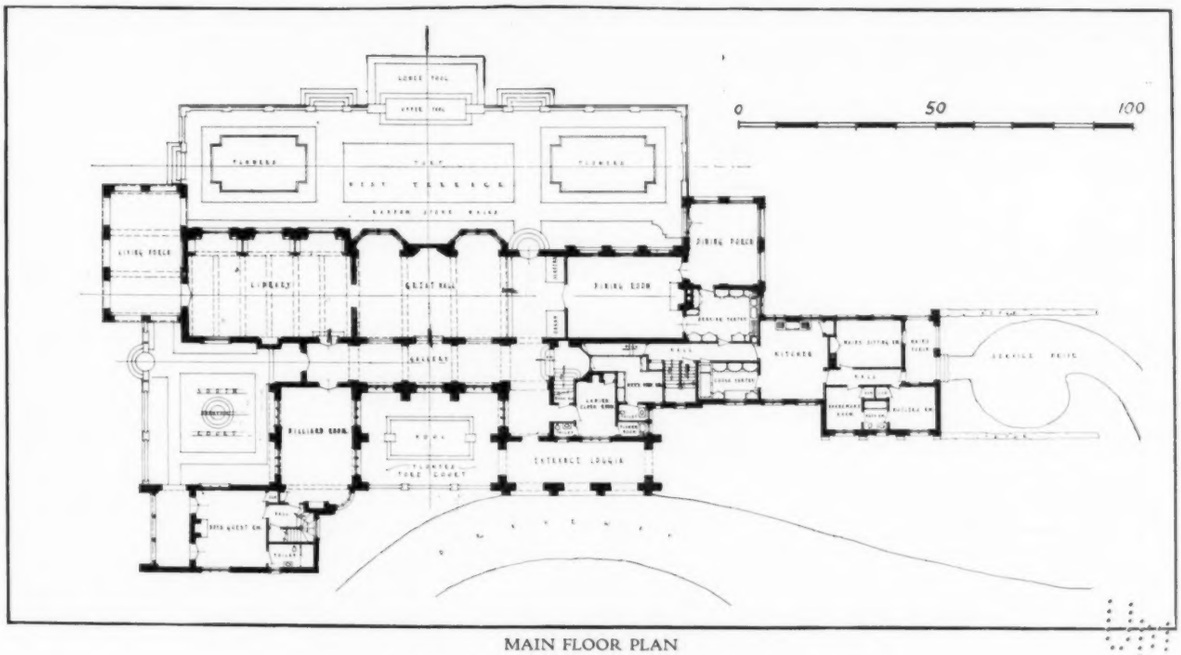


VIEW OF TERRACE AND GARDEN FRONT

HOUSE OF WILLIAM V. KELLEY, ESQ., LAKE FOREST, ILL.

HOWARD SHAW, ARCHITECT

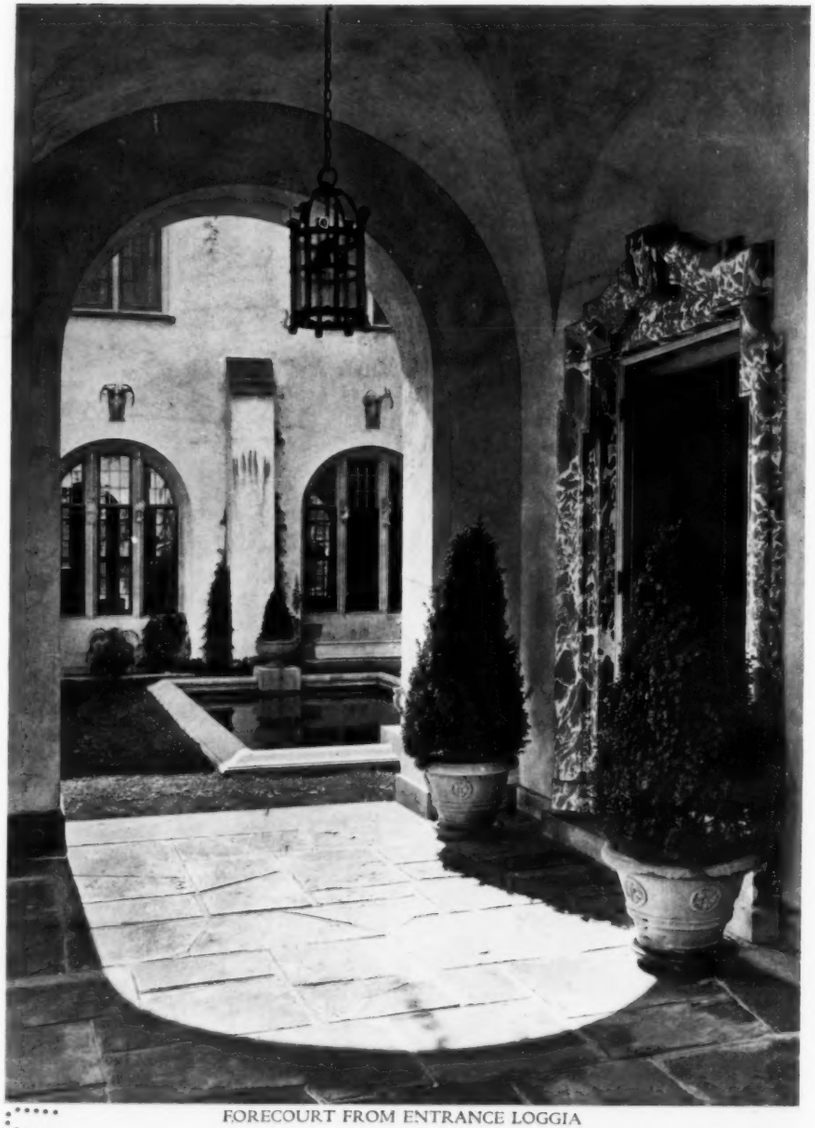
DETAIL OF SOUTH COURT



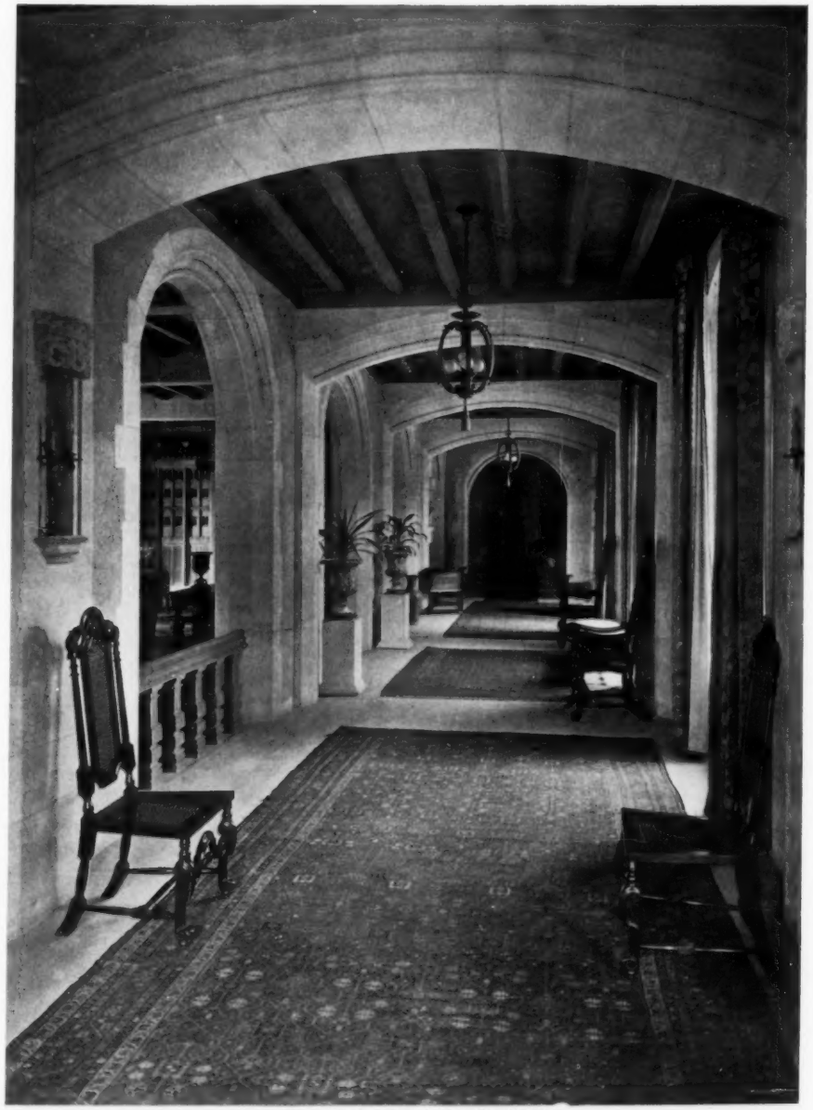
MAIN FLOOR PLAN

HOUSE OF WILLIAM V. KELLEY, ESQ., LAKE FOREST, ILL.

HOWARD SHAW, ARCHITECT



FORECOURT FROM ENTRANCE LOGGIA



GALLERY TOWARD STAIRWAY

HOUSE OF WILLIAM V. KELLEY, ESQ., LAKE FOREST, ILL.

HOWARD SHAW, ARCHITECT

GREAT HALL TOWARD ORGAN SCREEN

HOUSE OF WILLIAM V. KELLEY, ESQ., LAKE FOREST, ILL.

HOWARD SHAW, ARCHITECT

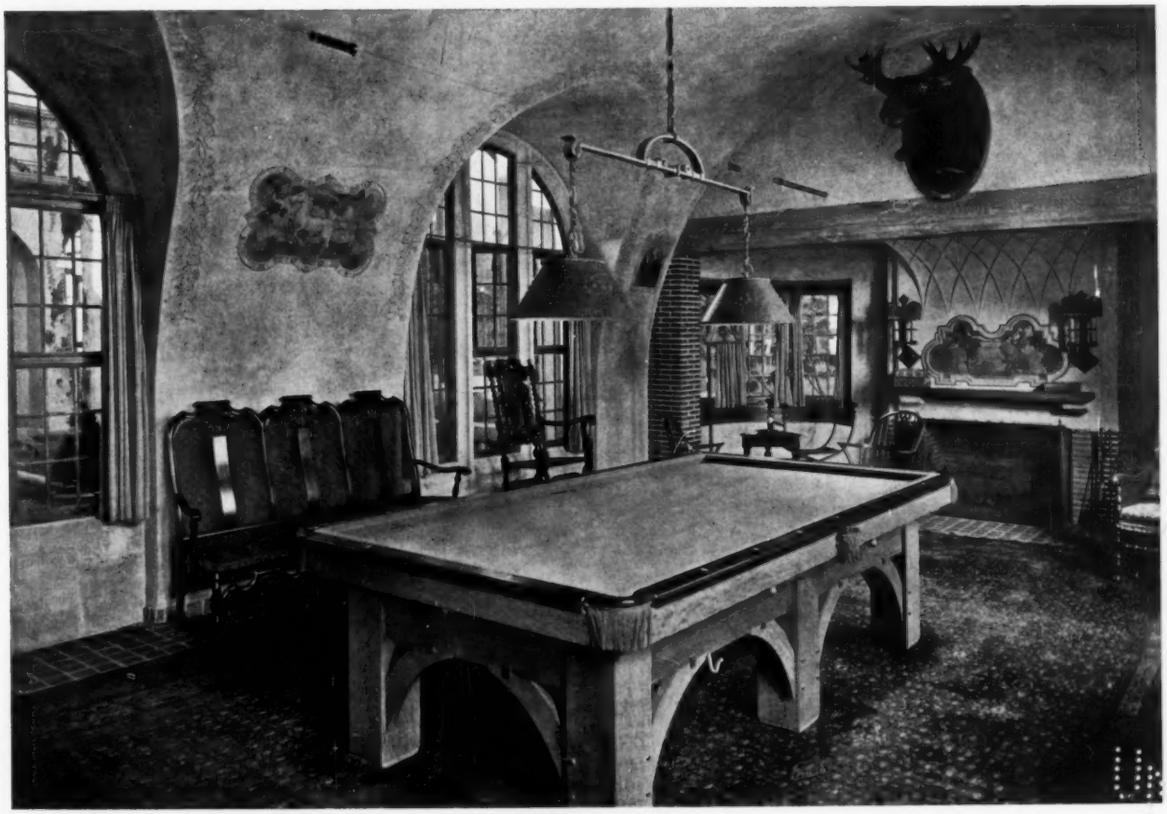
DINING ROOM

DINING PORCH

HOUSE OF WILLIAM V. KELLEY, ESQ., LAKE FOREST, ILL.

HOWARD SHAW, ARCHITECT

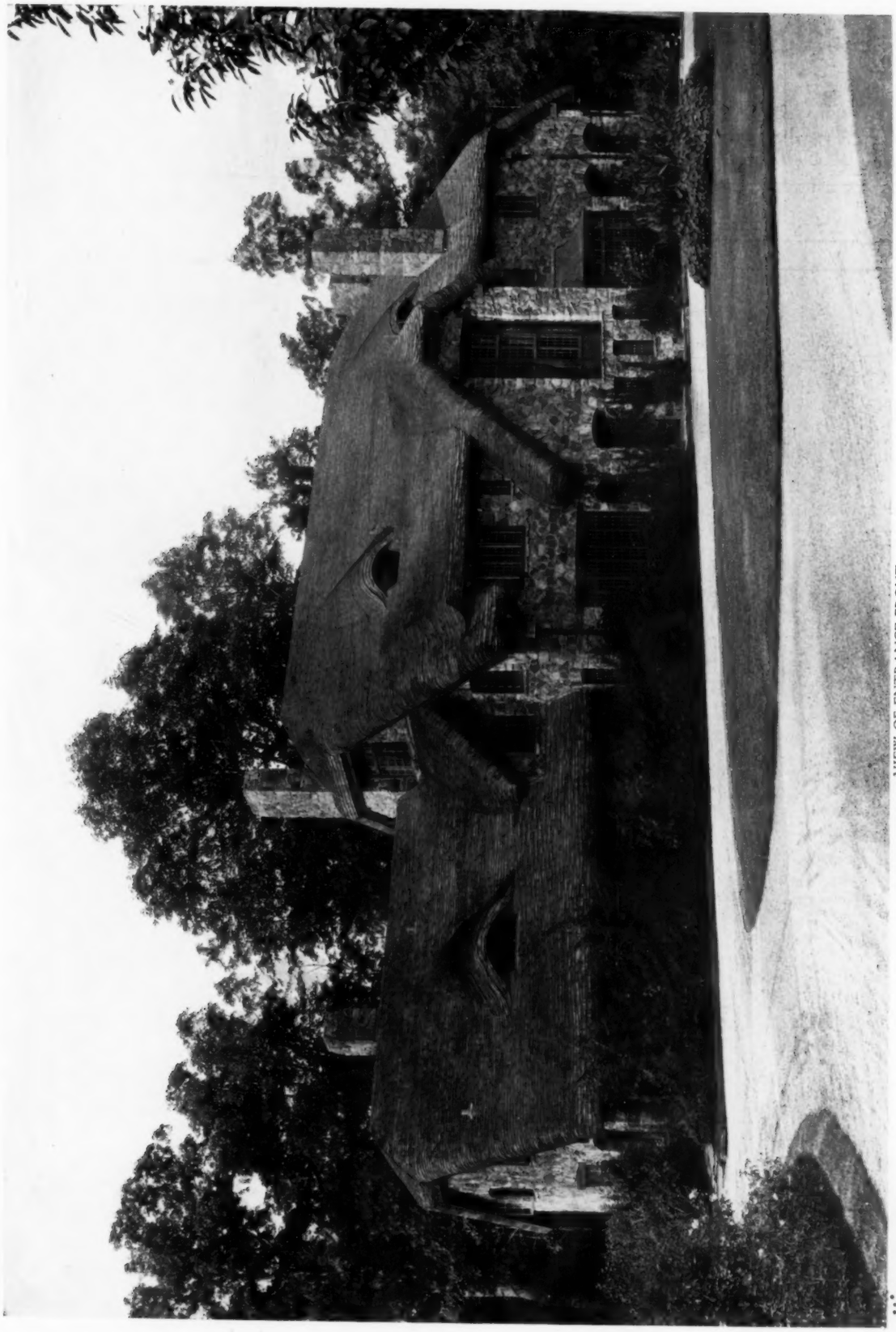
LIVING PORCH



BILLIARD ROOM

HOUSE OF WILLIAM V. KELLEY, ESQ., LAKE FOREST, ILL.

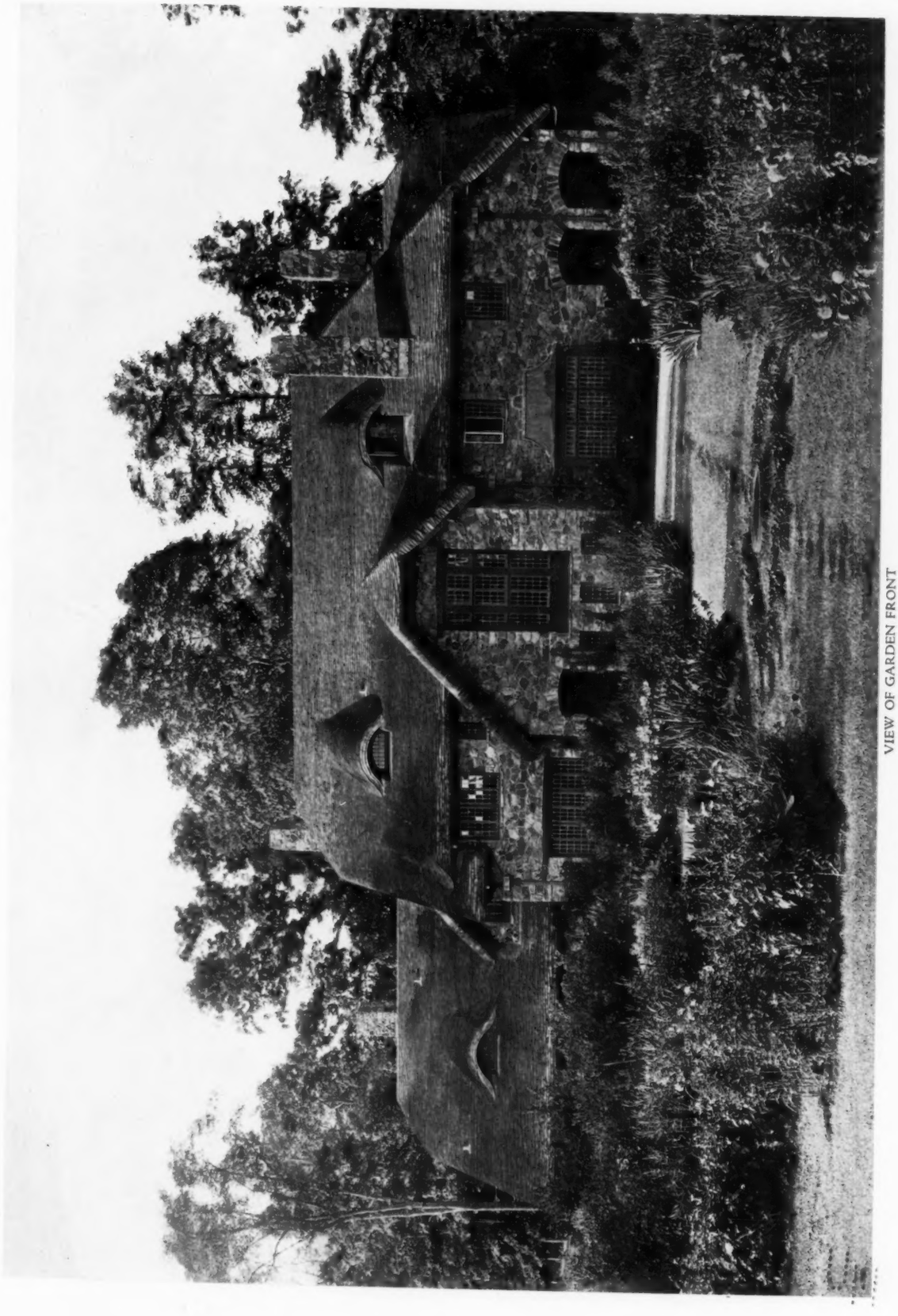
HOWARD SHAW, ARCHITECT



VIEW OF ENTRANCE FRONT

HOUSE OF MRS. H. J. DAVIS, SCARSDALE, N. Y.

W. STANWOOD PHILLIPS, ARCHITECT



VIEW OF GARDEN FRONT

HOUSE OF MRS. H. J. DAVIS, SCARSDALE, N. Y.

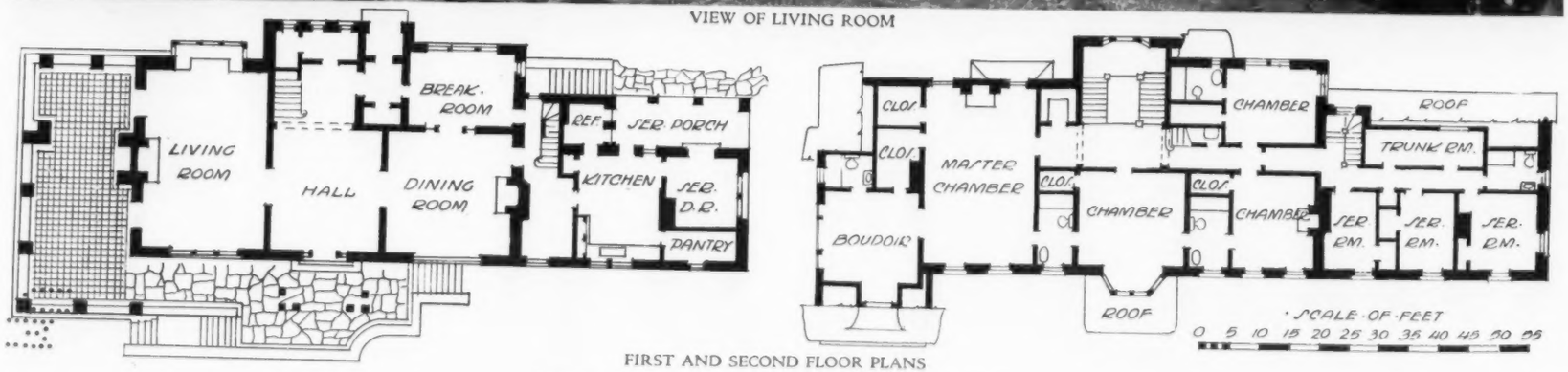
W. STANWOOD PHILLIPS, ARCHITECT

SERVICE WING AND GARAGE

HOUSE OF MRS. H. J. DAVIS, SCARSDALE, N. Y.

W. STANWOOD PHILLIPS, ARCHITECT

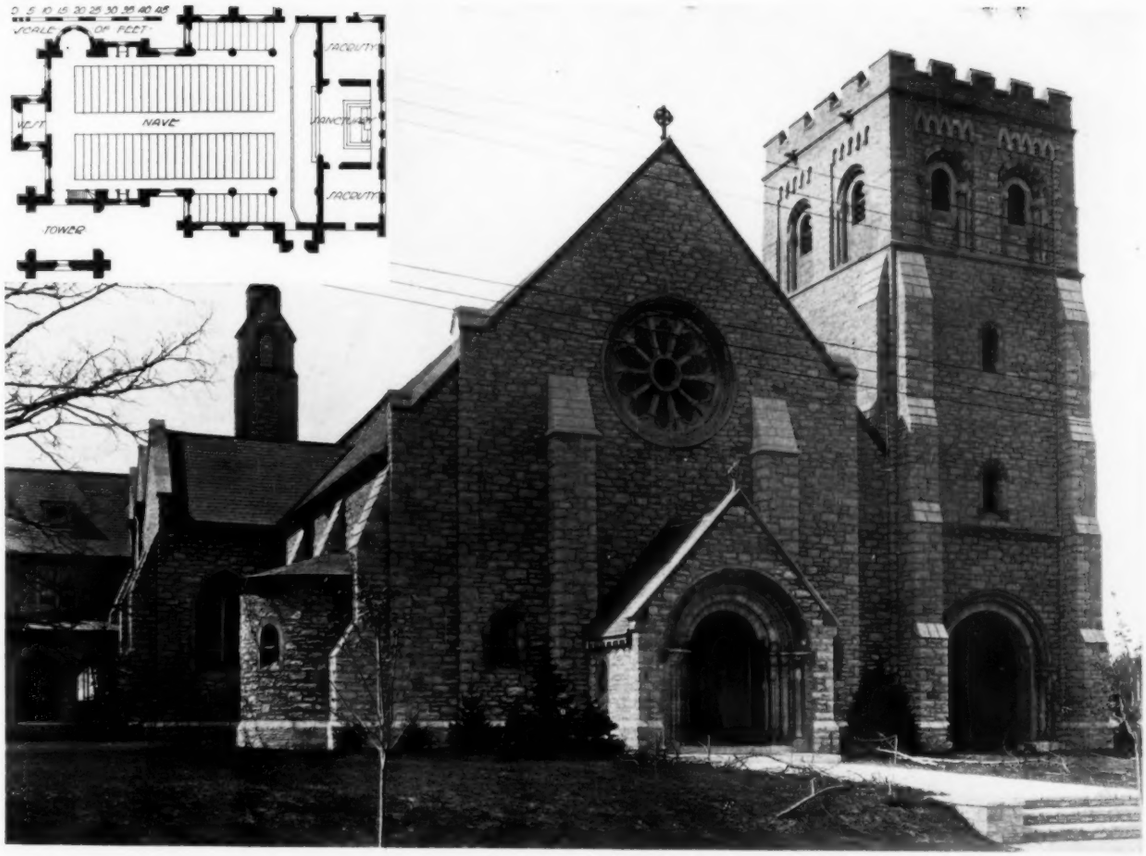
VIEW OF LIVING ROOM



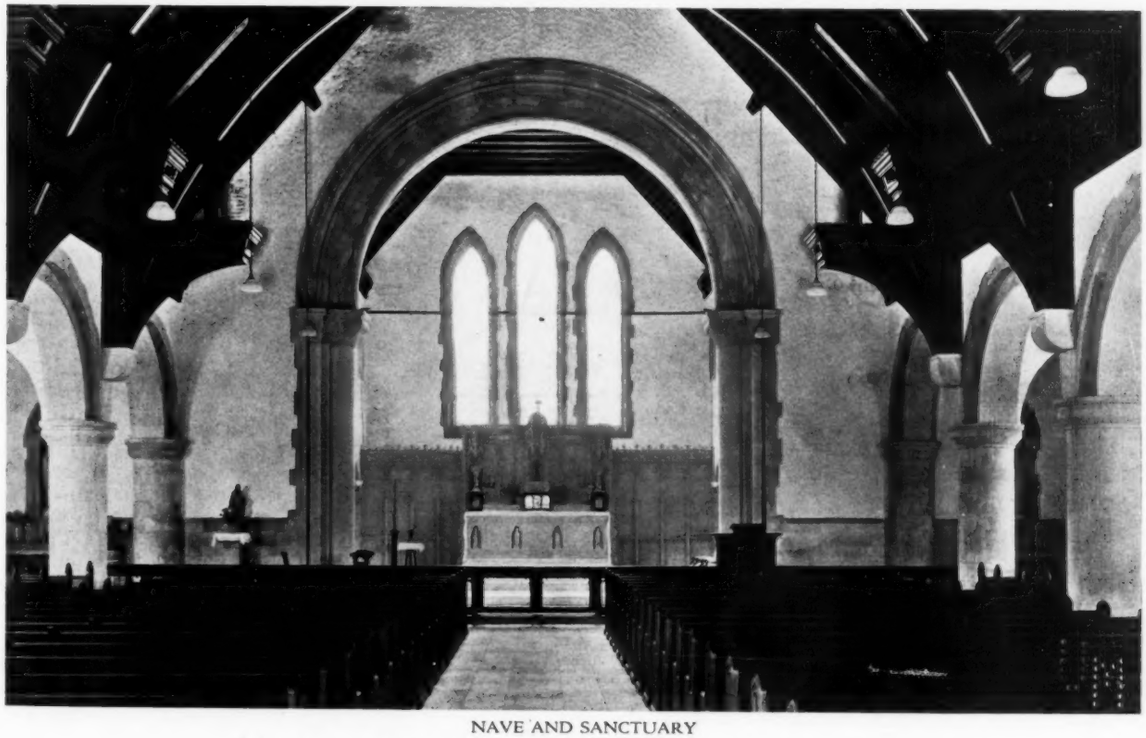
FIRST AND SECOND FLOOR PLANS

HOUSE OF MRS. H. J. DAVIS, SCARSDALE, N. Y.

W. STANWOOD PHILLIPS, ARCHITECT



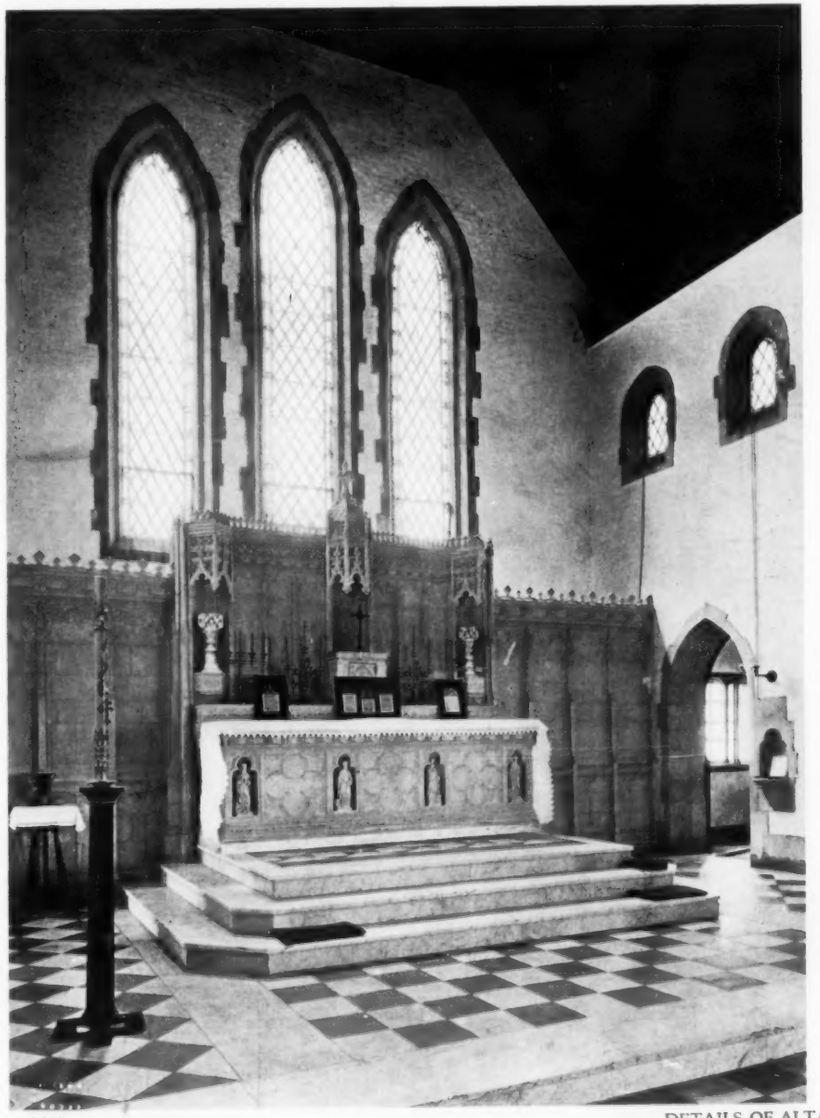
GENERAL VIEW AND FLOOR PLAN

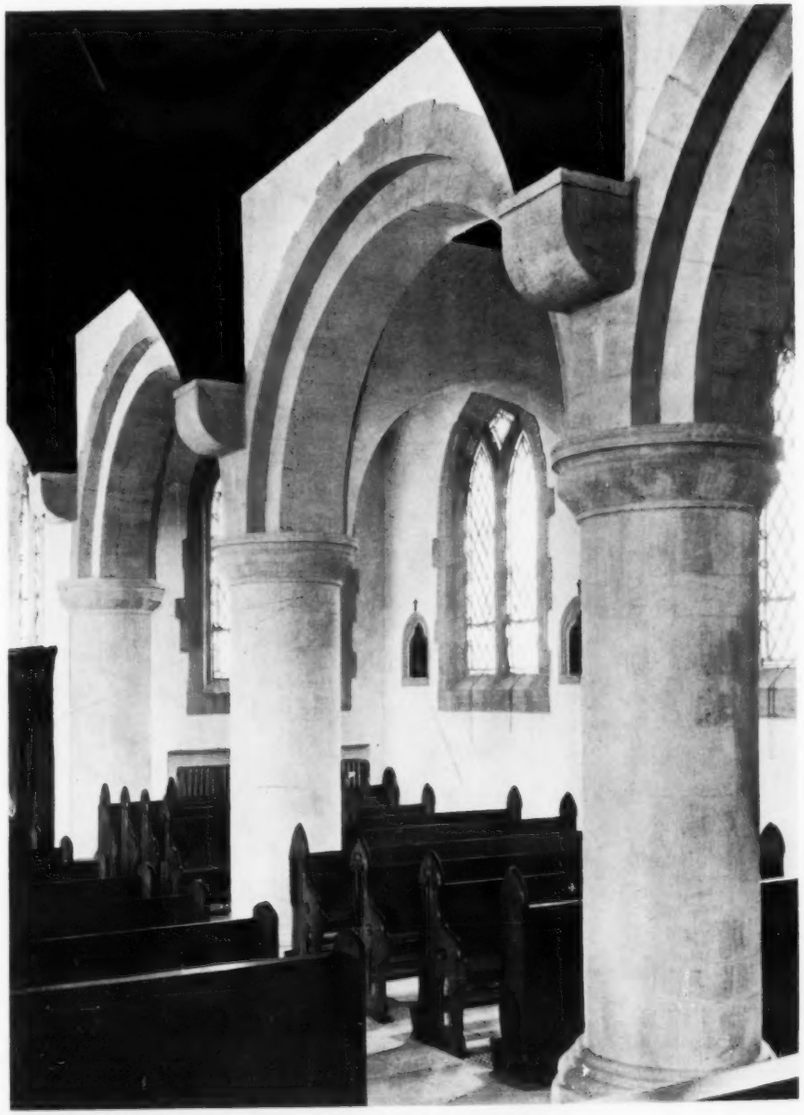


NAVE AND SANCTUARY

CHURCH OF OUR LADY OF LOURDES, ST. LOUIS, MO.

STUDY & FARRAR, ARCHITECTS

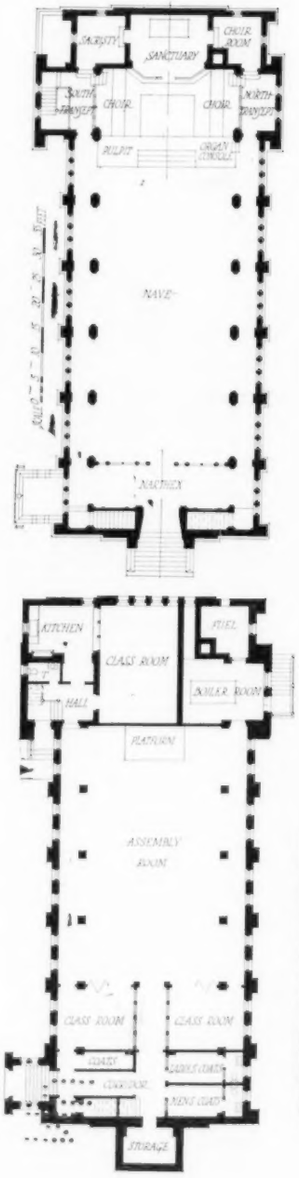




DETAILS OF ALTAR AND TRANSEPT

CHURCH OF OUR LADY OF LOURDES, ST. LOUIS, MO

STUDY & FARRAR, ARCHITECTS

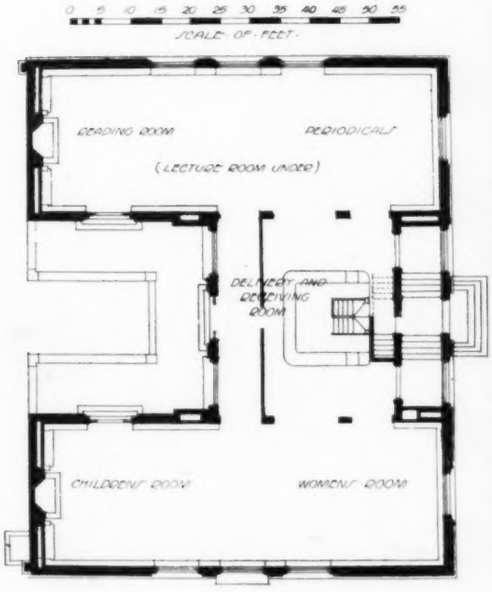


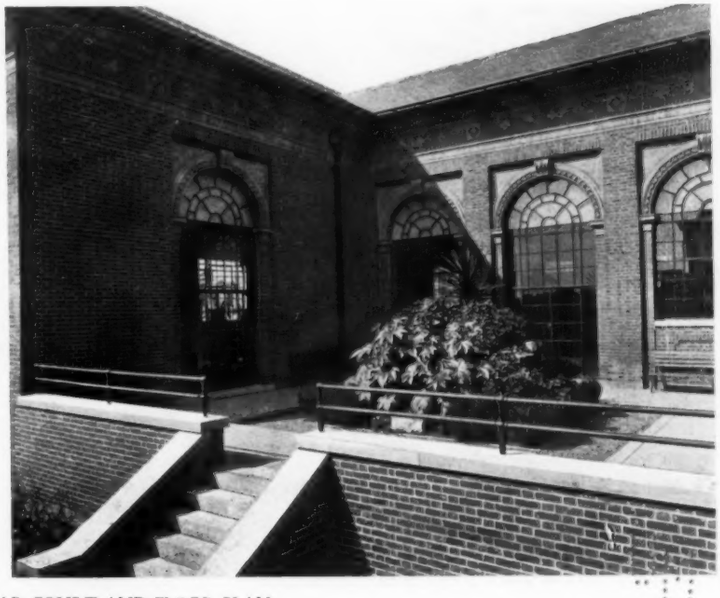
GENERAL VIEW AND FLOOR PLANS

GRACE EVANGELICAL LUTHERAN CHURCH, MINNEAPOLIS, MINN.

DESIGNED BY CECIL CHAPMAN. FORMERLY OF CHAPMAN & MAGNEY, ARCHITECTS

GENERAL VIEW





REAR COURT AND FLOOR PLAN

DOVERCOURT BRANCH LIBRARY, TORONTO, CANADA

CHAPMAN & McGIFFIN, ARCHITECTS